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THE IMPACT OF GENDER SOCIALIZATION ON WOMEN?S LEARNED TECHNOLOGICAL HELPLESSNESS AND ITS ANDRAGOGICAL IMPLICATIONS

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ON WOMEN'S LEARNED TECHNOLOGICAL HELPLESSNESS

AND ITS ANDRAGOGICAL IMPLICATIONS

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Abstract

This research investigated a proposed construct of learned technological helplessness (LTH) in female adult learners, which is believed to be impacted by socialization into traditional gender roles, teacher modeling, and age. A two-pronged approach was used to examine women's attitudes and beliefs about their abilities to use technology as a learning and personal productivity tool. Participants were females, over age 18, on two campuses of a public Midwest research university.

Prior to the primary research, a pilot study (n=204) was undertaken for the purpose of creating a teacher modeling instrument, which measured how teachers model the use of technology. The pilot study was necessary, as there are no known instruments that measure teacher modeling of technology.

Phase one of the primary study (n=236) used the Bem Sex Role Inventory (BSRI) to measure socialization into traditional gender roles. The General Computer Self-Efficacy (GCSE) instrument was used to measure general technological self-efficacy.

A path analysis was performed to address the primary research question, "Do age, teacher modeling, and the socialization of women into traditional female roles relate to technological self-efficacy in a way that is consistent with the construct of learned technological helplessness?" Despite the goodness of fit, as determined by the path analysis, the model does not support the hypothesis that socialization into traditional female roles mediates the relationship between age and technological self-efficacy (TSE).

A subsample (n=3) of women, who rated themselves as having low TSE, participated in a second phase that consisted of hour-long interviews, where patterns where analyzed for the purpose of providing an in-depth look at possible contributing

factors to low TSE. The patterns that emerged as participants discussed their low TSE are examined.

The results from phase one do not support the hypothesis that there is a partially mediated relationship between teacher modeling of technology and TSE. The construct of learned technological helplessness, as it was proposed, was not upheld. However, data from phase two suggests that the construct of LTH may exist as proposed. Refinement of the methods and further research are necessary.

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Chapter 1. Introduction

Since the 1990s, employers have increasingly listed technological literacy as an important employee skill (Rossiter, 1999). In 2008, it is almost impossible to imagine any kind of office without a computer and most corporate offices in the United States have a computer for every user. Attached to these computers may be stand-alone or networked peripherals, and the larger the office, generally speaking, the greater the number of electronic resources available. The more that an employee understands technology and can trouble-shoot simple problems with it, the more employable and valuable the person becomes.

It is well documented that the United States has not been able to keep its technological edge by relying on the products of its own educational system.

> Although the United States leads almost every other industrialized country in college attainment, and the academic achievement of U.S. students has been improving in recent years, U.S. students still tend to lag behind students in other countries with respect to some measures of achievement. In particular, the mathematics and science scores of U.S. students, especially older students, are lower than those of their counterparts in other industrialized countries. (National Center for Education Statistics, 1997, p. xxii)

One way that the U.S. could begin to rectify this problem is to start orienting girls and women to embrace technology from an early age and continue promoting the value of embracing technology throughout their entire formal educations. In a recent interview with Courtney Macavinta (2007) of the CIO Strategy Center, Telle Whitney, president and CEO of the Anita Borg Institute for Women and Technology, states, "If 50% of

women became interested in IT [information technology], it would solve the problem we have regarding the lack of talent in the IT workforce" (para. 19).

Encouraging women to embrace technology would help to reduce the deficit in the technology sector. It would also be a start in reducing pay disparity between men and women, as women moved into the relatively high paying field of IT; but there is an even more fundamental reason than that. It is a widely held belief among educators that all persons above the age of three need technology skills, as evidenced by the National Educational Technology Standards (NETS), developed by the International Society for Technology in Education (ISTE) (2007). These national standards outline what children should know and be able to do with technology at all ages. Following is a list of the technology standards for ages Pre-K through 2nd grade. According to ISTE (2007), prior to the completion of 2nd grade, a student is expected to be able to perform the following tasks:

1. Use input devices (e.g., mouse, keyboard, remote control) and output devices (e.g., monitor, printer) to successfully operate computers, VCRs, audiotapes, and other technologies.
2. Use a variety of media and technology resources for directed and independent learning activities.
3. Communicate about technology using developmentally appropriate and accurate terminology.
4. Use developmentally appropriate multimedia resources (e.g., interactive books, educational software, elementary multimedia encyclopedias) to support learning.

5. Work cooperatively and collaboratively with peers, family members, and others when using technology in the classroom.
6. Demonstrate positive social and ethical behaviors when using technology.
7. Practice responsible use of technology systems and software.
8. Create developmentally appropriate multimedia products with support from teachers, family members, or student partners.
9. Use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories.
10. Gather information and communicate with others using telecommunications, with support from teachers, family members, or student partners (para. 1).

Clearly, if culture has evolved to the point where even very young children need technology skills, then there is a need to bring adults' skills to the same level, but not simply for the sake of creating a society that is infused with technology; rather adults need these skills in order to function as part of a society that can solve increasingly complex problems through technological literacy (Eisenberg, 2005).

We live in exponential times, that is to say a time when increasingly larger exponents are required to express the rate of growth in information and technology, times where information and the ways that we access and organize that information are changing faster than at any other time in history. According to Educause (2007), the amount of unique, new information generated worldwide this year was more than in the previous 5,000 years, and a projection from Swanson and Gilder (2008) indicates that this trend of exponential information growth will continue:

> From YouTube, IPTV, and high-definition images, to 'cloud computing' and ubiquitous mobile cameras—to 3D games, virtual worlds, and photorealistic telepresence—the new wave is swelling into an exaflood of Internet and IP traffic. An exabyte is 10 to the 18th. We estimate that by 2015, U.S. IP traffic could reach an annual total of one zettabyte (1021 bytes), or one million million billion bytes. (p. 1)

This trend of exponential technology growth can be seen in Figure 1.

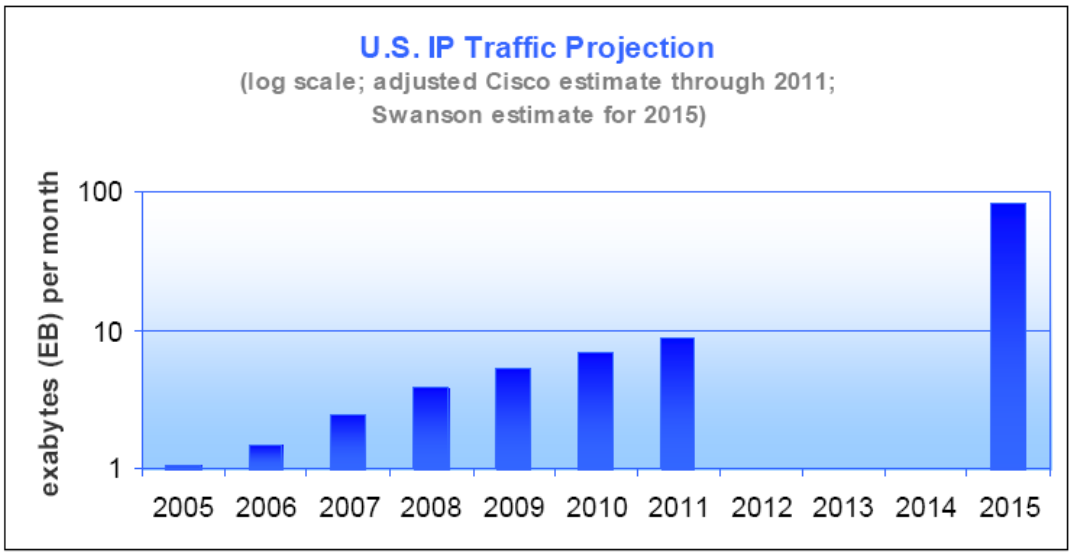

Figure 1. U.S. Internet protocol traffic projection (Swanson & Gilder, 2008, p.1). Used with permission.

Today, even simple personal and household electronics require some technical knowledge. Consider the television as the most basic example. Televisions are potentially connected to a plethora of devices including satellite dishes, digital cable, surround sound systems, VCRs, DVD players/recorders, and TiVo digital recorders. Each of these devices comes with a separate remote control, so even turning on the individual devices requires some technical competency. A look around the average American household or local big box retailer will confirm that more and more common

household appliances are partially or fully electronic and offer advanced programming features, including touch pad microwaves with cooking sensors, self-cleaning ovens with digital timers, and washers and dryers that communicate specific fabric care information with each other via universal serial bus (USB) interfaces. Many thermostats, lights, and security systems are now programmable. Similarly, a look at currently produced vehicles will confirm that automobiles now have built-in remote openers that require programming to open garage doors or security gates, digital video disc (DVD) systems for entertaining back seat passengers, and global positioning satellite (GPS) systems for navigation.

Even communicating in today's world requires some technical ability. Home telephones are now portable and programmable with a multitude of features including caller ID, call waiting, call waiting ID, call return, and call blocking to name a few. Gone are the days when one simply picked up the receiver and started speaking. As of this writing in July 2008, the counter on the web site of the CTIA, the wireless association, listed the number of cell phone subscribers in the United States at 261,408,369, a 769% increase since 1995 when the United States Census Bureau (2004) reported 34 million subscribers. With the pace of technology advancing so quickly in all areas of life, it should come as no surprise that employers expect workers to have at least basic technological proficiency (Linam, 2004).

Because technology has moved into the fore of daily life, those who do not have a high level of technological literacy will suffer a competitive disadvantage, as employers pass them over for more highly-skilled workers. This is particularly true for women who are still clustered into traditionally female-dominated, low-tech positions such as clerks

and entry level healthcare workers (Zorn, 2006), positions that are sometimes referred to as the pink collar ghetto (Ehrenreich, 2001). According to the United States Census Bureau (2001), females comprise just over 51% of America's population, and according to Kaslow (1989) many of these females have been socialized to be generally helpless. I have personally seen that many women in both university and corporate settings act particularly helpless when using technology. While there have always been different expectations for Western women compared to men, the idea was heavily reinforced during the 19th century when writings and discourse on separate spheres flourished.

> The language of 'separate spheres' has become a metaphor, which historians have increasingly used to analyze women's role in history and society. It has been used to describe the marginalization of women into their own separate sphere, their own 'proper' sphere, separate and distinct from the sphere of men. (Ross, 2006, p. 228)

Separate spheres of work for women, also known as the cult of femininity (Cutter, 1992) or the cult of domesticity (Matthews, 1987) was and is discriminatory, but from a practical standpoint it was less problematic in bygone eras than it is in the digital age of the 21st century when most adults need at least a rudimentary knowledge of technology just to be able to utilize the features of their appliances, telephones, and vehicles. Educating males and females equally, rather than by outdated, preconceived notions on what jobs are best suited to each based on biology will not only help to increase the number of technologically literate employees in the workforce, it will also increase the overall efficiency and self-esteem of countless women as they navigate through all the technology encountered in 21st century daily life. Unfortunately, generations of separate

spheres have not provided women with the skills they need to utilize technology effectively, and socialization into traditional gender roles has encouraged women to accept a lack of technological self-efficacy (TSE) as normal. This lack of TSE can lead to a phenomenon that I refer to as Learned Technological Helplessness (LTH), wherein an individual fails at using technology and then, based on these failures, comes to believe that future attempts at using technology will also fail. For the purposes of this research, technology is defined as electronic machines, components, and wireless devices used for personal, educational, and professional productivity as well as those used for entertainment and the infrastructures behind such devices.

Learned Technological Helplessness is built upon the existing theory of Learned Helplessness (LH) that states, "When experiences with uncontrollable events leads to the expectation that future events will elude control, disruptions in motivations, emotion, and learning may occur" (Peterson, Maier, & Seligman 1993, p. vii). The focus of LTH is on women's beliefs about their abilities to use technology effectively as a learning tool and for personal productivity in a technology-driven society. This research was framed and analyzed with a feminist emancipatory philosophical perspective.

Consistent with the stages identified in Peterson, Maier, and Seligman (1993), LTH manifests itself as follows: (a) uncontrollable events when using technology activate the coping process; (b) the individual will evaluate appropriate coping strategies; (c) if subsequent attempts at using technology fail, the user will internalize the failure; and (d) future technology performance will be negatively impacted. While LTH is consistent with LH in the above aspects, there are two important differences. First, LTH is based on perceived control and is, therefore, about beliefs. Actions are based on the learner's

beliefs and the anticipated outcomes of actions taken. In contrast, according to Peterson et al. (1993), 'complete cases' of LH must contain three specific components: Contingency, cognition, and behavior.

> *Contingency* refers to the objective relationship between the person's actions and the outcomes that he [sic] experiences. The most important contingency here is uncontrollability: a random relation between a person's actions and the outcomes that he [sic] experiences.
>
> *Cognition* refers to the way in which the person perceives, explains, and extrapolates the contingency.
>
> *Behavior* refers to the observable consequences of (non)contingency and the person's cognitions about it. Most typically helpless studies measure someone's passivity versus activity in a situation different from the one in which uncontrollability was first encountered. (p 8)

The first difference, then, between LH and LTH is that in the former, contingency is controlled and/or measured in some way, usually by the researcher while LTH does not require an objective relationship between the person's action and the outcome; rather, it is sufficient that the individual *believes* that the results are uncontrollable. If the learner believes that she (Since this research concerns itself exclusively with female learners, the feminine pronoun is used throughout.) has no control over an outcome, her actions and the end result are the same as if no control existed.

The second difference is that LTH can manifest itself as vicarious helplessness. According to Brown and Inouye (1978), vicarious helplessness "is most likely to occur when observers witness a model whom they perceive to be of similar competence

consistently fail at a task despite high expenditure of effort" (p. 900). American women of previous generations were not socialized to be good at technology; that was men's work, so there remains a severe lack of female technology role models (Gallagher & Person, 2000). Cisco Systems, Inc., a multinational technology corporation, views the lack of female role models in technology as problematic and has created the Gender Initiative project to address the disparity:

> Information Technology (IT) has become a powerful force for transforming social, economic, and political life around the globe. However, women throughout the world often run the greatest risk of being excluded from the opportunities offered by the field of IT. Without proper IT recruitment strategies and training, women will continue to be left behind unless we take action now. (Gender Initiative, 2007, para. 1)

Cisco's focus is specifically on a lack of women in the IT field, but there is a lack of tech-savvy female role models in American society in general. To prove this, stop for a moment and think about current technology innovators and role models. Who comes to mind? Bill Gates? (Microsoft) Steve Jobs? (Apple) Larry Page and Sergey Brin? (Google) Any women?

The Problem

For the last 12 years, I have taught adults how to use technology as a learning and productivity tool in both the corporate and higher education sectors, and I have observed a trend when otherwise intelligent, competent women learners exhibit a disbelief in their ability to attain proficiency in using technology at an alarmingly high rate as compared to their male peers. In working and conversing with these women, I have come to

understand that for many of them, past failures when using computers or other technology have led them to believe that future attempts at using technology will also fail; as a result, they simply stop trying. This current research study was undertaken in an attempt to understand this phenomenon and begin building a theory of Learned Technological Helplessness (LTH), using the existing theory of LH as a foundation. This research was conducted primarily through quantitative methodologies but qualitative strategies were also incorporated to further examine the phenomenon.

Hypotheses

The hypotheses for the research were as follows:

1. There is a relationship between age and women's technological self-efficacy that is completely mediated by socialization into traditional female roles.
2. There is a relationship between teacher modeling of technology usage and technological self-efficacy that is partially mediated by socialization into traditional female roles.
3. There is a correlation between women's past failures using technology and their beliefs about technological self-efficacy.

Hypotheses one and two are shown as the Model of Learned Technological Helplessness (Figure 2).

Assumptions

There were several assumptions that I made as I undertook this research.

1. The construct of LTH would be more prevalent in women who are socialized into traditionally female roles than in those who are not.

2. The attitudes, beliefs, and choices surrounding technology exhibited by role models will transfer, at least partially, to female learners' attitudes, beliefs, and choices surrounding technology.
3. Socialization varies by age, and older women are more likely than younger women to exhibit behaviors consistent with the construct of LTH.

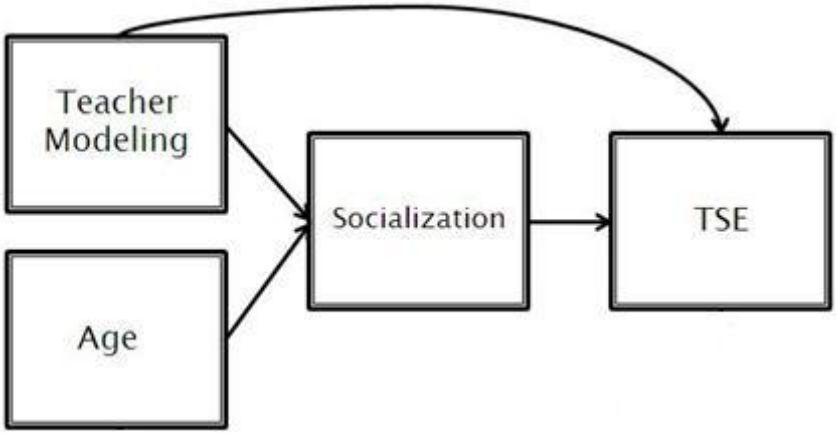

Figure 2. The learned technological helplessness model
Note: TSE = Technological self-efficacy

Foreshadowing Issues

Learned technological helplessness (LTH) is based on perceived control over a situation involving technology as a learning or productivity tool and is, therefore, about beliefs. Beliefs can, of course, be self-identified, but there are also behaviors that may indicate the presence of LTH beliefs, whether conscious or not:

- Constantly making self-deprecating remarks about one's inability to use technology effectively ("I've always been stupid when it comes to technology" or "I'm just technologically incompetent.")

- The expressed belief that one is more technologically inept than one's peers ("Everyone else in my class gets this, but I know I never will" or "I know the other managers all use the new system, but I just can't understand it.")

Not only have I observed that women exhibit these behaviors far more frequently than men, I have noticed that the older the woman learner, the more likely she is to experience this phenomenon.

Socializing women to avoid the supposedly complicated tasks of utilizing and maintaining electronics in the home and office may have worked in generations past, but it is a gross disservice and miseducation of today's girls and women. In the 21st century, technological illiteracy is no longer an option for most adults for a number of reasons cited by the Southern Regional Education Board (2006) including the following: (a) The way people live and work has been transformed in many ways because of technology and advanced communication; (b) economic, technological, informational, demographic and political changes escalate at a rapid rate; and (c) the workplace is demanding more highly skilled workers, and the skills are continually being re-defined. As part of a major social institution, educators have an opportunity, and an obligation, to begin changing the way that the U.S. socializes its female students to use technology.

While the proposed theory of LTH may be new, other educators have realized how socialization impacts women's learning. In *Shifting Sands: Reflections from the Field of Higher Education*, Barbara Harrison (2001) reflects on how early role models affected her adult learning.

> I realize now that some of my greatest problems in higher education were the result of the attitudes I learned in my childhood and youth. I grew up in an era

> when the image of fulfillment for women was one of wife and mother. This image was ubiquitous in movies, music, radio, magazines, and television and was reinforced by parents and peers. (p. 494)

How women are socialized has changed since Harrison's childhood, but for many the image of fulfillment remains one of wife and mother; the big difference now is that we can have careers, higher education, and interests outside the home, but not in lieu of those traditional female roles. In the words of the Enjoli fragrance jingle, "I can bring home the bacon, fry it up in a pan, and never, never let you forget you're a man, 'cause I'm a woman!" (Commercialsihate.com, 2007, n.p.)

Since the second wave women's liberation movement, women have been expected to be it all—breadwinner, wife and mother.

> Among couples in which both husband and wife work, 67 percent of all women said they did most of the food shopping, 68 percent said they did most of the cooking, 63 percent said they did most of the cleaning and 60 percent said they paid most of the bills, a lopsided division of labor that male respondents hardly disputed. (Cowan, 1989, para. 28)

With so many other responsibilities, something has to give; it would appear that for many women learning things like how to hook up a surround sound system or defragment a computer's hard drive are among the types of tasks that must receive a lower priority, and this creates a distinct disadvantage for women.

In the digital millennium, anyone who wants to remain competitive in business and effective at home needs these types of skills. It does women a gross disservice to

continue socializing them in ways that makes technology usage and integration a low priority.

> Research shows that expectations are gendered and reinforced throughout life. The gendered expectations communicated to women during childhood and adolescence continue to be reinforced and challenged in adult women's lives. Marriage and motherhood, as well as women's role in paid employment, continue to be gendered expectations, although those new expectations now take new forms. (Hayes & Flannery, 2000, pp. 65-66)

One of the primary ways that these expectations are reinforced is by observing others. If those role models have been socialized to remain incompetent at utilizing technology effectively—and many females have been—then vicarious LTH is expected to occur.

Educational institutions also play a significant role in socializing females in specific ways. Schools "impose upon girls a restricting set of sexual stereotypes that discourage their aspirations and limit their sense of autonomy and self-image" (Murphey, as cited in Corcoran, 1997, p. 1019). It becomes relevant, therefore, to examine the function of teacher modeling in shaping women's views of themselves and their beliefs about their inherent ability to interact effectively with technology.

Purpose of the Study

This research attempted to lay the groundwork for the establishment of a theory of Learned Technological Helplessness (LTH), which is suspected to be influenced by the gender socialization of females into traditional gender roles in a patriarchal society. The purpose of this research was to determine if there is a link between TSE and (a) women's socialization into traditional gender roles, (b) age, or (c) teacher modeling of technology.

A triangulation design was used, which utilized both quantitative and qualitative data. In this approach, quantitative survey data were used to measure the relationship between socialization and women's learned technological helplessness. Concurrently, the same constructs were explored using interviews with female college students in Missouri. The reason for collecting both quantitative and qualitative data is to bring together the strengths of both forms of research and integrate the results from two different perspectives.

It is important to note that this research was not approached from a standpoint of deficit theory, that is to say that the researcher was not looking for a deficiency in women that makes them less able to utilize technology as a problem-solving instrument; on the contrary, the focus was on the impact of the socialization process in society at large and in schools specifically, on competent women's abilities to use technology.

Research Questions

The primary research question was, "Do age, teacher modeling, and the socialization of women into traditional female roles relate to technological self-efficacy in a way that is consistent with the construct of learned technological helplessness?" Other questions of importance included the following:

1. What are women's beliefs about how their socialization in a patriarchal society contributes to their own technological self-efficacy?
2. How have past experiences using technology affected women's current perceptions of their ability to use technology effectively?
3. How has teacher modeling impacted women's view of technology as a tool for learning and personal productivity?

4. What do women learners believe that adult educators can or should do differently to facilitate higher technological self-efficacy in women students?

This study focused on establishing a theory of learned technological helplessness in female, adult learners. The participants were a convenience sample of female students at two separate campuses of a public, Midwest research university.

Delimitations

The purpose of this study was to determine if there is a relationship between the constructs of TSE and (a) women's socialization into traditional gender roles, (b) age, and (c) teacher modeling of technology that would lead to a theory of Learned Technological Helplessness in U.S. female adult learners. This study used a convenience sample of females over age 18 who attend college at one of two separate campuses of a Missouri, public research university. The study was conducted during the Winter/Spring 2008 semester. The participants were adult volunteers who were in the Education buildings of each campus, which means that the participants consisted primarily of education students, staff, and faculty. This research will not be generalizable to other populations. Further studies will need to be conducted to confirm the relationships, or lack thereof, in an effort to move from theory building towards an actual theory that could be generalizable to other types of female learners in other regions of the United States.

Significance of the Study

One of the problems facing female adult learners in the digital age is that current social structures are helping to keep them ignorant of technology (Rosser, 2006). Some feminist scholars believe that "technology and society are bound together

inextricably" (Wajcman, 2006 p. 83) and that it is almost "impossible to imagine a woman-centered perspective in the absence of patriarchy" (Rosser, 2006, p. 31). If these scholars are correct, then it could help explain why some women are experiencing LH when using technology. Past studies on gender and technology have focused on workforce dynamics and not on women as users of technology (Rosser, 2006). This research helps fill this void in the literature, as it examines how social factors contribute to LTH in women who use technology.

Based on prior studies, unlearning helpless behaviors does not appear to be a complicated process. Studies in literacy and mathematics demonstrate that predictions are self-fulfilling and can often be overcome simply by helping the student mentally predict success rather than failure (Oldfather, 1996; Wieschenberg, 1994). Oldfather (1996) states, "the subjective reality (i.e., the perception of the student) is central to the nature of his/her response to particular situations" (p. 3). This re-visioning approach should be tried with adult learners who are struggling with achieving technological self-efficacy.

As previously mentioned, all adults in the digital 21st century need at least a rudimentary knowledge of technology but many women are severely lacking in these skills. Without basic technology skills, women will have increasing difficulty using the plethora of electronic devices that have become a part of daily life and they will lose ground in the battle to achieve wage parity because they will not have the requisite skills needed to compete.

Malcolm Knowles' (1984) assumptions of andragogy posit, among other things, that adults are primarily intrinsically motivated and have a life-centered or problem-

centered orientation to learning. It is not unreasonable to assume, then, that women who struggle with the problem of using technology for learning and personal productivity will begin seeking out adult education programs as a means of rectifying the problems that a lack of technological proficiency can cause. Forward-thinking adult educators can assist this segment of learners by identifying and understanding the phenomenon of LTH in women and promoting the skills necessary for utilizing technology as a life-long learning and productivity tool. Once we understand this phenomenon more fully, we can begin to explore revised teaching paradigms and methods that may lead to a reduction in LTH in women.

For the purposes of this study, the following definitions are used. Where the origins of the definitions are not specifically noted, the definitions are mine.

Key Terms

Andragogy: The art and science of helping adults learn (Knowles, 1970)

***Feminism*:** There are many lenses through which feminists look. For the purposes of this research, feminism refers to radical feminism, which "recognizes the oppression of women as a fundamental political oppression wherein women are categorized an inferior class based on their sex" (Keetley & Pettigrew, pp. 23-24).

Gender: A socially constructed notion of what constitutes femininity and masculinity. This is different from sex, which is based on biological differences.

Gender Roles: Gender roles are defined as attitudes and behaviors related to one's gender as defined by the society in which one resides.

***Learned Helplessness*:** A psychological condition in which a human has learned to believe that s/he is helpless in a particular situation, and will therefore stop trying to

affect the outcome even though s/he might have control over said outcome (Peterson, Maier, & Seligman, 1993).

Learned Technological Helplessness: A psychological condition in which a human has learned to believe, based on past failures using technology, that she is helpless in utilizing technology in the future even though she might have control over the outcome.

Radical Feminism: The belief that "the oppression of women is a fundamental political oppression wherein women are categorized an inferior class based on their sex" (Keetley & Pettigrew, pp. 23-24).

Self-Efficacy: Self-efficacy is defined as people's beliefs about their abilities to perform and how these beliefs influence outcomes (Bandura, 1977).

Socialization into Traditional Gender Roles: The cumulative effects of all social institutions acting on an individual to pressure that individual to conform to a set of norms based arbitrarily on gender.

Technological Self-efficacy (TSE): TSE is a person's beliefs about his/her ability to perform technology related tasks and how these beliefs influence outcomes.

***Technology*:** Electronic machines or components and wireless devices used for personal, educational, and professional productivity as well as those used for entertainment and the infrastructures behind those machines.

Vicarious Helplessness: A situation that occurs when a person feels helpless simply from having witnessed other people, with whom she identifies closely or looks up to, being helpless in a similar situation (Peterson, Maier, & Seligman, 1993).

In this chapter, I elucidate the need to increase the number of U.S. workers with advanced technology skills and promote the belief that women remain an untapped

reservoir of technology workers. This study is intended to be the beginning of a theory of LTH in adult females. It is my hope that once adult educators better understand the phenomenon of LTH, we can begin exploring revised teaching paradigms to help women students unlearn helpless behaviors associated with using technology.

Summary and Organization of the Study

Statistics have been introduced that demonstrate that we live in exponential times. Such times require technology skills just to perform the now ordinary daily tasks of turning on the television and its attached devices, making a cellular telephone call, using a computer, or sending a file electronically. It is, therefore, no longer a viable option to leave technology in the hands of a few qualified experts. These days, even very young children need rudimentary technology skills just to play games and talk on the telephone. In the teen years, greater skills are needed to operate household appliances, drive cars, and conduct research for school. In the adult years, even more advanced technology skills are required for personal productivity in the home, in postsecondary education, and in the workplace. Failure to teach adults how to utilize technology tools effectively — particularly women, many of whom have been socialized to remain helpless when utilizing technology—will add to the current shortage of highly trained U.S. workers and will help ensure that women stay in marginalized and subordinate positions.

The remainder of this study is organized into four additional chapters, and will conclude with references and appendices. Chapter two presents a review of the literature as it pertains to human learned helplessness, self-efficacy, feminist frameworks on gender roles, andragogy, and teacher modeling.

Chapter three describes the methodology of the study. This was a mixed methods study that utilized quantitative methods to examine correlations between TSE and women's socialization, age, and teacher modeling of technology. Qualitative techniques were also used to explore if and to what extent women's socialization interacts with technology.

Chapter four presents the research findings on the relationship between TSE and (a) women's socialization into traditional gender roles, (b) age, and (c) teacher modeling of technology. The chapter is divided into subsections that present the quantitative findings, qualitative findings, and the convergence of the two.

Chapter five contains a discussion of these findings as well as suggestions for further research. The study concludes with references and appendices.

Chapter 2. Review of the Literature

The primary research question is, "Do age, teacher modeling, and the socialization of women into traditional female roles relate to technological self-efficacy in a way that is consistent with the construct of learned technological helplessness?" In an attempt to answer this question and articulate an understanding of the phenomenon of learned technological helplessness (LTH), I examined the literature of human learned helplessness, self efficacy, feminist frameworks on gender roles, andragogy, and teacher modeling. Using current literature, I elucidate what we know and do not know about how context may affect women's beliefs about themselves and their abilities to perform certain types of tasks, specifically tasks relating to using technology as a learning and productivity tool. I also examined adult learning theories and studies in teacher modeling to explicate what we do and do not know about why adults choose to learn certain things over others, and how teachers' actions might help or hinder the learning process for women.

The canon of feminist frameworks on gender roles is so large that it merits its own section in the review of the literature. Additionally, since the actions that we take cannot be separated from who we are as social beings, the unifying theme throughout the review of the literature is an inquiry into how gender roles intersect with the remaining four frameworks of (a) learned helplessness, (b) self efficacy, (c) andragogy, and (d) teacher modeling. Once an intersection has been established, the research examines how each intersection might specifically impact women's technological self-efficacy and if the impact is consistent with the construct of learned technological helplessness.

Introduction

Because gender roles are believed to intersect with each of the other frameworks in significant ways, it is important, at this point, to make it explicit that I am a radical feminist. What this means is that I believe that of all the forms of oppression in U.S. society, the oppression of women is the most prevalent and that all of women's experiences are inseparable from the oppression under which we live and are socialized. This declaration, while important for reducing researcher bias, is a difficult one for me to make in light of how we currently define knowledge.

In using any of today's labels, such as radical feminist, it implies an acceptance of the idea that our current way of constructing knowledge is the one right way, an idea with which I adamantly disagree. As Lorraine Code (1991) succinctly put it,

> As long as 'epistemology' bears the stamp of the postpositivist, empiricist project of determining necessary and sufficient conditions for knowledge and devising strategies to refute skepticism, there can be no feminist epistemology. . . Ideals of objectivity, impartiality, and universality are androcentrically defined. Their articulation maps onto typical middle-class white experiences to suppress the very possibility that the sex of the knower could be epistemologically significant. (p. 314)

Wajcman (1991) also notes that research findings and 'facts' are social constructions and that under a variety of circumstances, dissimilar 'facts' may be uncovered by different social scientists. In fact, Wajcman devotes an entire section of her *Feminism Confronts Technology* to critiquing "scientific knowledge as patriarchal knowledge" (p. 5).

Specific to technology, radical feminists believe that patriarchy and technology are inseparably intertwined.

> Radical feminism rejects most scientific theories, data, and experiment not only because they exclude women but also because they are not women-centered. Radical feminism suggests that because men, masculinity, and patriarchy have become completely intertwined with technology and computer systems in our society, no truly feminist alternative to technology exists. (York, 2008, para. 4)

At this juncture, it is not my goal to propose any alternatives to technology as we currently know it but rather to provide the lenses through which I make meaning of selected the literature as it relates to women's socialization and how that socialization might impact technological self-efficacy (TSE).

I do not pretend, as some researchers do, that I am completely unbiased, for this is simply not possible in my opinion. As a serious researcher, committed to letting the facts speak for themselves, I have considered alternate views for other possible explanations for the phenomenon under investigation, rather than to make the fatal research flaw of assuming to know the answer and then looking for evidence to back it up. The effort exerted to remain unbiased about women's social roles in a patriarchal society and how this might affect TSE is considerable and includes an analysis of anti-feminist literature, including the writings of well-known, self-proclaimed anti-feminists Phyllis Schlafly and Nicholas Davidson.

I also do not presume that I speak for all radical feminists. It would not make sense to claim that I speak as any kind of authority for all radical feminists or for all females while simultaneously pointing out the problems inherent in men speaking as the

dominant authority for all persons. Many white feminists have been guilty of thinking, speaking, and acting as if the oppression that they experience as whites (or those who pass for white) is the same oppression that minority women experience. Some middle and upper-class feminists have made similar mistakes in assuming that they experience oppression in the same way that women of lower socioeconomic classes do. Feminism, regardless of the orientation, should never be about putting men down; it should be about building women up—all women.

Rationale for the Chosen Literature

The theory of human learned helplessness (LH) is the existing theory that best provides a framework for examining the phenomenon of women's LTH, but there are some things that the theory of LH does not explain. I examine the history of LH studies, the premises of LH theory as it pertains to humans, discuss its limitations as they pertain to women's TSE and, building upon the existing LH constructs, have begun collecting evidence that may eventually support a new theory of learned technological helplessness.

Because the research is concerned with women's self-efficacy when utilizing technology, Albert Bandura's (1977a, 1977b, 1986) work on self-efficacy is drawn upon throughout. The general construct of self-efficacy is discussed, as is the construct of vicarious learning, which has been demonstrated to influence performance (Bandura 1977b).

Within andragogy, as defined by Malcolm Knowles (1970), I examine the underlying assumptions of how adults learn and what factors affect learning; I then analyze the limitations of these assumptions as they relate to female adult learners, including the limitation of the construct of andragogy as a whole.

> What feminists have termed 'feminist pedagogy' goes beyond andragogy, because it takes the specificity of women's experience into account. Female learners come to class with specific personal histories, learning styles, and expectations that are shaped, to varying degrees, by their experiences as girls and women in a society characterized by male power and privilege. (Burge & Lenksyj, 1990, para. 11)

I additionally draw on other theories in adult education, such as transformative learning and critical learning theory to see how they support or refute Knowles' contentions of how adults learn and how contextual factors impact adult learning. Despite the fact that adult educators have recently begun examining contextual factors, certain factors are still receiving less attention from theorists, including the dynamic of gender and how this impacts adult learning (Cain, 2002). In order to be as inclusive as possible, adult educators have an obligation to understand how women's unique experiences may impact their adult learning outcomes and revise existing adult learning theories if and when necessary.

Finally, I examine the contemporary literature on modeling as a specific practical application of socialization, utilizing the works of authors such as Bandura (1977, 1986) and Henschke (1998). The specific questions that I considered as I analyze the literature in this section include the following: "How has teacher modeling impacted women's view of technology as a tool for learning and personal productivity?" and "What do women learners believe that adult educators can or should do differently to facilitate higher technological self-efficacy in women students?"

Theoretical Frameworks

Theoretical frameworks are important for both deductive and inductive types of

studies, as they guide the research in deductive studies, and guide what the researcher does or does not notice in exploratory studies (Borgatti, 1998). Maxwell (2004) defines a theoretical framework as the ideas and beliefs that the researcher holds about the phenomenon under study. Throughout the review of the existing body of knowledge, literature was analyzed that supports this researcher's beliefs about the possible causes of learned technological helplessness. Literature that offers alternative explanations for the phenomenon under study has also been analyzed and the strengths and weaknesses of all the literature as it applies to the LTH construct is examined.

Learned Helplessness

In order to begin establishing a theory of Learned Technological Helplessness (LTH) as it relates to U.S. female adult learners, this research builds off the existing theory of learned helplessness, which in its simplest terms is a "statement of the effects of uncontrollability on behavior" (Garber & Seligman, 1980, p. xv). The construct of learned helplessness (LH) as it relates to control in humans states, "When experiences with uncontrollable events leads to the expectation that future events will elude control, disruptions in motivations, emotion, and learning may occur" (Peterson, Maier, & Seligman, 1993, p. vii).

A major component of the LH theory is the coping process. Mikulincer (1994) posits that coping responses vary based on the amount of failure; in small amounts, failure leads to improved performance and in large amounts it leads to diminished performance. Similarly, LTH is thought to be impacted by past failures using technology and the larger the amount or severity of failure, the more likely it is that LTH will occur.

Early learned helplessness studies. Seligman and Maier (1967) conducted the earliest studies on animals that established the LH paradigm. In these studies, dogs were divided into three groups. The first two groups consisted of pairs of dogs that received electrical shock. Each dog in the pair received the shock but only one dog could terminate the shock, causing the shock to appear random to the second (no control) dog. A third group of dogs received no shock. All three groups were later tested in an apparatus that allowed them to escape the shock by jumping over a partition. Dogs that could control the shock and the dogs in the control group tended to avoid the shock, whereas the dogs that received the apparently inescapable shock passively accepted the shock rather than try to avoid it. Seligman and Maier claimed that the animals had *learned* to be helpless.

In later studies on rats, the outcomes were similar to that of the dogs in the first trails. Rats that received helplessness training becoming passive and accepting of trauma that they believed they were powerless to control (Maier and Seligman, 1976).

Learned helplessness in humans. After consistent findings on LH in animals, researchers naturally wanted to know if humans would act similarly under LH conditions. Early human research involved two types of studies; the first type examined the effect of inescapable noise on future avoidance of unpleasant events, and the second type studied the effect of unsolvable problems on future problem-solving ability (Hiroto 1974; Mikulincer, 1994).

In the Hiroto noise studies, as described by Mikulincer (1994), during a learning phase, college students were separated into three groups, those that received but could control unannounced bursts of noise (escape group), those that received but could not

control unannounced bursts of noise (helplessness-training group), and those who received no noise (control group). During the testing phase, all subjects experienced loud bursts of noise, which they could control.

> The results paralleled those observed with animals: Subjects exposed to helplessness training were less likely to learn to escape the noise than subjects in the other two groups; subjects in the escape group did not show any impairment and performed as well as subjects in the no-noise group. (Mikulincer, 1994, p. 5)

These results seemed to indicate that the human subjects that had learned to be helpless under one set of conditions transferred this helplessness to another situation with similar conditions.

The second common type of early human LH studies examined the effects of unsolvable problems. In these cognitive studies, like in the noise studies, there were also three groups of participants, the control (no problems) group, an escape (solvable problems) group, and a helplessness-training (unsolvable problems) group. In the test phase, subjects were exposed to noise as described in the preceding paragraph, and the results were the same. "Subjects in the unsolvable condition were less likely to learn to end the noise than subjects in the solvable and no-problem group" (Mikulincer, 1994, p. 6). The difference in this study compared to the first, was that participants transferred their learned helplessness from one set of conditions to a completely different type of condition.

These two studies have implications for the current study on LTH. The findings of the noise studies suggest that (a) it is entirely possible that past failures in using technology might account for future helpless behaviors in using technology, and (b) the

findings of the cognitive experiments demonstrate the possibility that failures in a completely different set of circumstances might also account for LH in using technology.

As LH studies moved into new areas of research, the construct definition has, according to the original theorists, "been overused and applied promiscuously to situations that do not bear a convincing relationship to pure cases" (Peterson, Maier, & Seligman, 1993, p. 9). According to Peterson, et al., pure cases of LH must contain three specific components—contingency, cognition, and behavior, as previously defined (p.7). The theorists state that simply *believing* that one has no control is not sufficient to label a condition learned helplessness. This seems inconsistent with the researcher's definition of cognition, which "refers to how the person *perceives* (emphasis mine), explains, and extrapolates the contingency" (Peterson, Maier, & Seligman 1993, p. 8). It bears repeating that this is where the research on LTH departs from the existing research on LH, as beliefs occupy a fundamental position in this researcher's conceptualization of LTH.

The primary difference, then, between LH and LTH is that in the former, contingency is controlled and/or measured in some way, usually by the researcher. In contrast, LTH does not require an objective relationship between the person's action and the outcome; rather, it is sufficient that the individual *believes* that the results are uncontrollable. If the learner believes that she has no control over an outcome, her actions and the end result will be the same as if no control existed.

It was also expected that LTH might manifest itself as vicarious helplessness. Vicarious helplessness is defined as a situation that occurs when a person feels helpless simply from having witnessed other people, with whom she identifies closely or looks up

to, being helpless in a similar situation (Peterson, Maier, & Seligman, 1993). The research on vicarious LH seems to be inconclusive, with Brown and Inouye (1978) finding a link between what a person witnesses and then is able later to do, while Chartier and Friedlander (1981) found no such link. At present, there does not appear to be any research on vicarious helplessness as it relates to technology usage. The construct of vicarious helplessness will be discussed in greater detail in the *Self-Efficacy* section, *Vicarious Learning* subsection.

The intersection of gender roles and learned helplessness. As an Educational Technologist, I have heard countless women learners make self-deprecating remarks about their abilities to use technology to solve both simple and complex problems, and I have witnessed intelligent women acting as if they were incapable of learning to use even the simplest technology. I have heard and seen these things in the corporate sector, higher education, and in the homes of female friends and colleagues. In virtually all of these instances, I can say unequivocally that these women were sufficiently capable of learning to use the technology at their disposal, whether they wanted to or not may have been another story. The salient point here is that I witness these behaviors and hear self-deprecating comments from female learners at a much higher rate than from male learners. I am left wondering then, what is the difference between that male and female adult learners that seems to make more of the females learn to be helpless.

While there has been some research conducted on women who experience LH, the scope is rather limited. Psychologists who study LH in women have primarily focused on LH as it pertains to depression (Abramson, Edwards, Garber & Seligman, 1977; Garber & Seligman, 1980; Peterson, Maier, & Seligman, 1993) or as it pertains to

spousal abuse (Walker, 1979; Wauchope, 1988). Educational research has contributed to the existing body of knowledge by studying LH in academic subjects, such as mathematics and physics, but there is scant research on LH as it relates to task completion. A logical extension of the existing theory of LH is to explore the phenomenon as it relates to completion of tasks that utilize technology in an age where technology is ubiquitous. This understanding will add to the existing canon of behavioral research in the fields of both adult education and educational technology.

Technological self-efficacy (TSE)

It was proposed that LTH would be seen as a manifestation of technological self-efficacy (TSE). TSE is self-efficacy as it applies to technology. For this study, technology is defined as electronic machines used for personal, educational, and professional productivity as well as those used for entertainment, and the infrastructures behind those machines. Self-efficacy is defined as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performance" (Bandura, 1986, p. 391) or stated more simply as people's beliefs about their abilities to perform. But there is more to self-efficacy than merely judging, organizing, and executing actions. Actions have consequences:

> People's beliefs in their efficacy have diverse effects. Such beliefs influence the course of events that people choose to pursue, how much effort they put forth in given endeavors, how long they will persevere in the face of obstacles and failures, their resilience to adversity, whether their thought patterns are self-hindering or self-aiding, how much stress and depression they experience in

> coping with taxing environmental demands, and the level of accomplishments they realize. (Bandura, 1997, p. 3)

Using Bandura's work as a starting point, this study examined women's diverse beliefs about their overall self-efficacy in an attempt to draw conclusions about how such beliefs might impact women's ability to utilize technology as a learning and productivity tool.

Vicarious helplessness. In Bandura's (1977b) model of self-efficacy, he proposed four sources of information that affect behavior, among them vicarious experience. Logically, we know that children learn much through observation and imitation of others in their family units and communities. They learn how to speak and they learn what behaviors are acceptable under a variety of conditions. Likewise, they may learn vicariously what things are possible or likely to be possible by observing others. Bandura's (1977b) social learning studies provide some of the earliest evidence of vicarious influences on performance, noting that in addition to mastery as a source of information that impacts self-efficacy, expectations may also be "derived from vicarious experience" (p. 197).

In a study of undergraduate women, DeVillis, DeVillis, and McCauley (1978) tested Bandura's assumption of vicarious experience and concluded that "for females, assumptions about the degree of contingency in one's life are based, in part, on observations of similar individuals in similar circumstances" (p. 899). Based on what we know about how observations affect children's learning and studies such as the one conducted by DeVillis et al., it is reasonable to assume that women's LTH may also manifest itself as vicarious helplessness, that is, women may learn to be helpless when using technology based on their observations of others using technology. The construct

of TSE is significant because it impacts women's ability to learn, work, and function effectively when performing daily tasks in a wired, and soon to be wireless, world.

The intersection of gender roles and self-efficacy. In the conceptualization of LTH in women, technological self-efficacy is believed to be influenced through the process of socialization. We know from many types of studies (see Lockheed 1993; Saxon & Altermatt, 2007; Siegel, 2006;) in the social sciences that males and females are indeed socialized differently. Studies in criminology demonstrate that "girls are socialized to be less aggressive than boys" (Siegle, 2006, p. 56). Studies in education indicate that females are socialized differently from boys when it comes to using technology, both in terms of working in the IT field and in using technology for fun—as in playing computer games (Lockheed, 1993). Psychological research has demonstrated differences in emotions and stress between boys and girls, which were attributed to disparities in socialization. In a study that compared grades and stress, researchers discovered that girls, while they performed better academically, experienced higher stress.

> We think that girls are socialized to put more emphasis on pleasing people. This has positive consequences in that girls become more engaged in their school work, more motivated, listen better to the teacher, and all of this results in good grades. But, at the same time, they are constantly worrying about what happens if they do poorly. (Saxon & Altermatt, 2007, para. 10)

It is important to note that the participants of this study were elementary schools girls, and by grade seven, many had lost their academic edge. This phenomenon has also been

studied extensively and has been found to be related to socialization (American Association of University Women, 1991).

Referring back to Bandura's (1986) definition of self-efficacy, wherein people judge and execute actions based on beliefs, would it be all that surprising if, in a society where women and girls are socialized to be more reserved and less adept at certain types of skill, such as working in the IT field or playing computer games for fun, girls exhibited lower TSE? We know, empirically, based on the aforementioned studies, that in some specific situations females are encouraged to act differently than males, and there is speculation that this disparate socialization may be at least partially to blame for some of the resultant problems. This begs the following questions: "How does socialization into traditional gender roles impact women's lives in general?" and "Does socialization into gendered roles have any impact on technological self-efficacy?"

Feminist Frameworks on Gender Roles: The Big Picture

Many of the philosophers who influenced Western traditions regarded women's ability to reason "different from and inferior to men's" (Jaggar & Young, 1998, p.1). If "in different from," the philosophers mean that women have the ability to admit that our personal views might not be the only correct or valuable views, then perhaps the philosophers are right, and we do reason differently. In *Women's Ways of Knowing,* (Belenky, et al., 1986), the four authors share five distinct perspectives, each of which is valid to the woman who lives it. Belenky, et al. never suggest that a solitary way of knowing or experiencing the world is more valid or true than another. On the contrary, while each reality is different, there are experiences that are common to each woman's

experiences and such commonalities inform the theoretical perspectives that are collectively labeled feminism.

Within the distinct feminist theories, one common theme continually emerges: multiple U.S. women's problems are products of social institutions (Faludi, 1991; Koedt, Levine & Rapone, 1973). These institutions dictate and promote distinct roles based on gender. Throughout the review of the literature, both pro-feminist and anti-feminist, the effect of traditional gender roles on women's learning was analyzed. Gender roles are defined as attitudes and behaviors related to one's gender as defined by the society in which one resides. This research is specific to the U.S. The importance of traditionally dictated gender roles cannot be minimized as merely a women's issue, as evidenced by how often this phenomenon is also analyzed by sociologists, social psychologists, anthropologists, linguists, and those interested in social cognition and media studies, many of whom are not feminists.

Epistemologically speaking, the analysis focuses on the influence of socialization in each of the other four aforementioned domains—human learned helplessness, technological self-efficacy, andragogy, and teacher modeling—utilizing radical feminism, which, as defined in the key terms section, "recognizes the oppression of women as a fundamental political oppression wherein women are categorized an inferior class based on their sex" (Keetley & Pettigrew, pp. 23-24). Using current literature, this research attempts to elucidate what we know and do not know about how being considered inferior may affect women's beliefs about themselves and their abilities to perform certain types of tasks, specifically tasks relating to using technology as a learning and productivity tool.

While every attempt was made to remain objective, my own experiences cannot be separated completely from the research nor do I think they should be. As a woman who has experienced oppression in a patriarchal society, I believe I bring unique insights to this research about women that a man could not offer. This follows the Marxist belief that those who are socially oppressed have access to knowledge which the socially privileged do not (Grasswick & Anderson, 2007). The emic, or insider, perspective is common in studies of culture.

> The anthropologist tries to understand a culture the way the members understand it, to learn the concepts they use and to try to see the world the way they do. The goal is to penetrate as deeply as possible into the culture and gain the greatest insight. By writing about the culture, the anthropologist allows readers to begin to appreciate how people in another culture live their lives and make sense of their world. (Minkus, 2007, para. 1)

In utilizing feminist frameworks on gender roles, I hoped to be able to answer the questions, "What are women's beliefs about how their socialization in a patriarchal society contributes to their own technological self-efficacy?" and "How have past experiences using technology affected women's current perceptions of their ability to use technology effectively?"

Socialization in patriarchal societies is based on traditional gender roles for males and females. Traditional gender roles in the United States refer to "the role of family instrumental leader [being] invariably filled by the man and the role of family expressive leader filled by the woman" (Wolf, 1975, p. 45). More recent research reveals that disparate social roles are still common in the U.S. (Schmitz & Diefenthaler, 1998). It

should be noted, however, that such a definition arises from a middle-class, Eurocentric viewpoint. Also, it is not sufficient to simply examine socialization's effect in adulthood, as socialization is a life-long process. As Phyllis Chesler (1994) writes, "college-level women's studies classes are important, but that's rather late in the day to start counteracting what people have already been learning all their lives" (p. 12). It is important to examine gender socialization at its origins, which these days begins from the moment that parents know their child's sex.

For many children in the U.S., indoctrination into traditional social roles begins very early in life (Abrahamy, Finkelson, Lydon, & Murray, 2003), and for many, it even begins in the womb vis-à-vis their parents actions. In 2008, parents may know their child's sex before birth. In middle and upper socioeconomic families, parents paint the nursery the 'appropriate' boy or girl color, female family members buy and/or make the 'correct' boy/girl clothing and layette items, and friends throw 'appropriately' themed baby showers. Even in poorer families, conventions such as only providing gender specific clothing and toys are followed.

As soon as children are old enough to watch television, the indoctrination into stereotypical gender roles continues through the images they view on television, in theatres, in books and on signs. Any parent of a child old enough to speak can attest to the fact that children learn symbols very early. Most typical three or four-year-olds in this country can point out a McDonald's sign, making meaning of the symbol long before they can actually read the words on the sign. Once the child enters school, the dominant cultural and ideological framework is reinforced over and over, day after day, year after year until it becomes so ingrained into their personalities that, they come to believe that

they are making free choices that have been made for them all along (Freeman, 1973), first by family and friends, then by the media, and finally by religious and educational social institutions.

Anti-feminists do not argue that sex-role stereotypes exist. In fact, Phyllis Schlafly (2003) not only admits that sex-role stereotypes exist but argues for them. "The Me Generation, which seeks only its own fulfillment, will probably say that sex-role stereotypes aren't fair" (p. 54). Schlafly argues not only that women should have separate roles from men but also that that women should subordinate their own wants and needs and focus their energy on supporting a husband:

> Wives are a tremendous asset to career-oriented men. Wives provide the nurturing of the children, the keeping of the house, the emotional security of a nest to come home to, and most important, the incentive for a man to work hard and succeed. (p. 53)

The outside world is clearly left to males as their domain, thus reinforcing that women do not need to learn how to engage actively in outer world issues. This embodies the cult of domesticity (Gabrielson, 2006).

Although girls enter U.S. schools with the alleged opportunity to become whatever they want, the socialization process over the next 13-17 years ensures that most will be corralled into the prescribed, traditional gender roles of a heterosexually obsessed patriarchy (Holland & Eisenhart, 1990). The sad part, however, is that most of these same women believe that it was completely their choice, never realizing the extent of social influences on their so-called choices.

> As the Bems put it, 'We overlook the fact that the society that has spent twenty years carefully marking the woman's ballot for her has nothing to lose in that twenty-first year by pretending to let her cast it for the alternative of her choice. Society has controlled not her alternatives but her motivation to choose any but one of those alternatives.' (Freeman, 1973, p. 128)

The marking of the ballot that the Bems referred to has been analyzed extensively in the field of communication studies.

In a research study commissioned by the See Jane program at Dads and Daughters, Kelly and Smith (2006) analyzed the portrayal of females and minorities in G-rated movies. Kelly and Smith found that in both live action and animated films, white males and their stories dominated. Smith believes that the "disproportionate numbers offer young children a transparent message that being male and white is not just the norm, but preferable" (p. 1). The research also revealed the following, all of which reinforce traditional gender and social roles:

- For every 1 female character, there are 3 male characters.
- More than two-thirds (72%) of speaking characters are male.
- More than four out of five (83%) narrators and speaking characters in crowd scenes are male.
- Characters of color are most often sidekicks, comic relief, or villains.
- Females are nearly twice as likely (66.3% versus 34.6%) to be identified as parents.
- Males are about half as likely (31.9% versus 60.7%) to be partners in committed relationships.

- Nonwhite males are portrayed as fathers nearly 20% less often than whites.
- Nonwhite males are portrayed as committed partners 23% less often than whites.
- Male characters display aggressive behaviors at a far higher rate than female characters.
- Nonwhite males are grossly underrepresented compared to their numbers as counted in census data while white males are overrepresented.

Smith reports that these differences appear irrespective of the specific production company that released the film and also that in the period from 1990-2004, "there was no significant improvement in gender imbalance or change in male role portrayals" (p. 4). A similar study, conducted by Hamilton, Anderson, Broaddus, and Young (2006), showed little improvement in most areas (titles and main characters are still male dominated) and worsening of gender stereotypes in other areas (women are even more likely to be portrayed as nurturers or victims than in the 1980s). The net result is that media images of female roles do not include the technologically competent.

Anti-feminists would have us believe that such sexist, racist media messages are a good thing. In a chapter entitled, *The Cinderella Complex*, Schlafly (2003) tells women that they can be Cinderella, marry prince charming, and have it all. "I know—because it happened to me" (p. 199). There are a few things that Schlafly does not take into consideration. What she does not consider is that not every woman wants or needs a man to sweep her off her feet and carry her away. Some women want to establish identities of their own, achieve goals that they have set for themselves, and learn to be good people, and this is more important than being some man's incentive for working hard. Second,

Schlafly assumes merely wanting such a life will bring it. She fails to consider the countless women who, for a multitude of reasons, could never achieve such a life no matter how badly they might want it. Not every woman has the opportunity to marry a lawyer and then become one herself, like Schlafly. Not every woman can bear children. Not every woman is able-bodied and attractive enough in her youth to capture the attention of a man of her liking. And even if a woman has all of the above, not every man is successful in his career even if he does work hard. Some men work hard all their lives and barely eke out a living. Not every man is a prince; some are abusive losers. Other men might be wonderful persons who eventually succumb to diseases, which affect their bodies or minds; still others might have issues with alcoholism, drug abuse, or mental disorders. Perhaps being Cinderella, whose big claim to fame was having the right size foot, is enough to make some women happy, but others of us may want to pursue higher education and/or careers free of someone else's preconceived notions about proper sex roles.

In *The Failure of Feminism,* Nicholas Davidson (1988) agrees with Schlafly's assertion that gendered roles are good for women. Davidson says that women are better off married, but not because any studies demonstrates empirically that married women are happier or healthier but because it makes "good economic sense" (p. 287). Davidson (1988) wants to perpetuate white male dominance just the way G-rated movies do.

> It is at last becoming widely known that the influx of women into the labor force over the past fifteen years has not resulted in the reduction of any levels of occupational sex segregation or in the average difference between male and female incomes. Women's wages still average about two-thirds of men's. As a

> result, it makes not just emotional or practical sense but also good economic sense for women to marry, and for married couples to treat the husband's income as primary. (p. 287)

Rather than correct the pay disparity, which is obviously not a problem for Davidson, his solution is for women to accept that they are devalued and marry a man who is not, so that the woman may survive financially. Davidson neglects to provide evidence for how it makes emotional sense for the woman—or even for the man who, in this scenario, is not being chosen for love but for his ability to provide what society has denied the woman from getting on her own—to be in such a relationship.

Davidson's book was written 20 years ago, but in the 21st century, many still agree with his assertion that women should not be in the workforce, and many of those who agree are women. In 2004, *60 Minutes* reporter Leslie Stahl profiled a group of successful working women who chose to leave the workforce to become full-time stay-at-home parents. The women indicated that "they didn't want their kids home alone, most of all because they wanted to be with them. They recognized the benefit not only for their children but for themselves" (Blythe, 2004). Few would argue that children benefit from being cared for by a family member; the issue is that society still places this responsibility squarely on the shoulders of women. Men are not encouraged to look out for their children's well-being or made to feel responsible for what children miss because of their father's absence.

When fathers do chose to stay at home and care for their children as the group of mothers did, the fathers are viewed as freaks. According to stay at home dad, Stephen de la Heras, "We do have to put up with some shit from the less enlightened crowd, and face

some additional obstacles in a mom-centric world" (as cited in Smith, 2006, para. 12). The 2004 U.S. census confirms that as a nation, the U.S. is "mom-centric;" of the nearly 8.5 million (8,411,765) stay at home parents in 2004, only 143,000 (1.7%) were fathers (U.S. Census Department, 2006).

It is not only through children's movies or the sex of the children's primary caregivers that sexist stereotypes are reinforced. Other studies have examined how sexist messages are transmitted to very young children through picture books (St. Peter, 1979) and how movies reinforce gender stereotypes for adults (Aubrey & Harrison, 2003; Herrett-Skjellum & Allen, 1996). Socialization into traditional gendered roles has changed little over time, but the way that the messages are delivered has changed tremendously. According to Anokwa, Lin, and Salwen (2003), instead of norms being handed down first from parent to child in the home and then reinforced in church and school, the media is now the first and most dominant purveyor and changer of gender norms.

Historical perspectives on gender roles. Making a case for how women have been relegated to the same subordinate positions, while everything else in the world has changed exponentially, necessitates examining traditional gender roles historically. For the purposes of bounding this research, this review was limited to a brief sample of works from the last 200 years.

In the early 1800s, the mode of transportation was horseback; today we fly around the world at speeds that were previously unimaginable. Two hundred years ago, our ancestors spent hours cooking over wood stoves, and today we use microwaves that take only minutes to prepare entire meals. Two centuries ago, it took weeks or even months

for letters to cross the ocean, and today we transmit correspondence to the other side of the world in seconds. Yet, with all of these remarkable advances in other areas of life, patriarchal society still forces most women into the same outdated predefined roles that were in effect hundreds of years ago—mother, wife, caregiver, and helpmate. Yes, women have more opportunities today than they did hundreds of years ago but, for many, their primary roles are unchanged and anything they might choose to do must be *in addition to* not *instead of* these primary, traditional roles.

Some will argue that religious texts, which are timeless, ordain such roles but these interpretations are subjective. In 1838, Sarah Grimke, in *Letters on the Equality of the Sexes and the Condition of Woman*, analyzes the King James version of the Bible and makes the case that in no scripture does God make man sovereign over woman. On the contrary, passage after passage demonstrates that both man and woman are masters of the other creatures of the earth and that only God is master over both men and women. If Grimke had stopped there, her reasoning would have worked, for "scripture is one thing, interpretation is another" (J. Henschke, personal communication, November 13, 2007). Grimke claims that women have always been treated as servants and property even back to Biblical times and points to Sarah who "obeyed Abraham, calling him Lord" (1 Peter 3:6). While some might consider this as evidence, it could just as easily be argued that Sarah used the term "Lord" out of love and respect for her husband and not because she was in any way being forced into subjugation. This is pointed out not to weaken the feminist argument that many women have been and continue to be oppressed, but rather to demonstrate that feminists must take care not to be guilty of using biased interpretation in the absences of facts, for if we do this, we are as guilty of twisting the truth to suit our

own interpretation as are the misogynists that skew the message of the Scriptures in order to suit their purposes of the continued subjugation of women under the guise that it is God's plan.

It must also be pointed out that many religious men helped open the door for women's equal opportunities. Ministers' daughters were some of the first females to receive excellent educations during a time when most women were not taught to read and write. Some notable examples include Jane Austen, Emily and Charlotte Brontë, and Harriet Beecher Stowe. It is not religion or religious men, per se, that are perpetuating the problem of disparate social roles, but the fact that some have used religion as an excuse to promote their own self-serving agendas and keep women from having access to knowledge and the power that knowledge brings.

Grimke (1970) makes a stronger case in pointing out the fallaciousness of some men's reasoning, specifically those who have been party to using and abusing women physically, mentally, and emotionally and then claim superiority over the very persons that they have injured.

> All history attests that man has subjected woman to his will, used her as a means to promote his selfish gratification, to minister to his sensual pleasures, to be instrumental in promoting his comfort; but never has he desired to elevate her to the rank she was created to fill. He has done all he could to debase and enslave her mind; and now he looks triumphantly on the ruin he has wrought, and says the being that he has thus deeply injured is his inferior. (p. 11)

Grimke's assertion is valid that it is unreasonable to deny women certain rights and privileges based solely on gender and then to further deny women because they lack the

skills and traits that such rights and privileges would have endowed them with in the first place.

During first wave feminism, which is defined roughly as the period from the mid-19th century until 1920 when the 19th amendment to the constitution was passed, women's status as second-class citizens was demonstrated in what society denied them; women were not allowed to own property, enter into contracts, be a plaintiff in a law suit, attend a university, or vote. Daring to do that which was prohibited could have serious consequences including imprisonment, as Susan B. Anthony discovered.

In the trial of Susan B. Anthony on the charge of illegally voting in the 1872 presidential election, Anthony refused to pay her $100 fine because the forms of the law that convicted her were "all made by men, interpreted by men, administered by men, in favor of men, and against women" (Code, 1991, p. 18). Anthony was sentenced to remain in prison until the fine was paid, but was never actually sent, most assuredly because that would have opened the doors to an appeal where she no doubt would have won, as she was denied her right to a proper jury trial (Peck, 1989). Regulations were upheld on the claim that women were incapable of logically reasoning, but feminists argued that any differences in women were due to the circumstances in which they were forced to live, circumstances not of their choosing. These claims were likewise dismissed, this time by phrenologists and other so-called scientists who claimed that "nature not nurture was what counted" (Russett, 2005, p. 47).

Psychiatrists and neuroscientists used phrenology to assess individuals' personalities based on the bumps of the skull. Like many other areas of 'science' and medicine, unsupported claims were used to maintain oppressive practices and silence

those who dared to point out the inequities between the sexes. It was alleged that a man could use phrenology to find a suitable wife. Phrenology was also used to make the racist and sexist claims that Africans and women were inferior (Code, 2002). Medicine has been used extensively as a means to silence uppity women who dared to fight back—women who demonstrated the strength of their convictions by being sent to prison rather than be denied the right to vote; women who proved their ability to reason by deconstructing the fallacies of unsubstantiated arguments against the intelligence of women; women who were strong, good, and ultimately proved to be quite powerful, as evidenced by their enduring contributions to politics, law, literature, and human rights to name a few. These contributions came at a price, however, and more than a few women who had the audacity to demand more, paid the price for their courage.

In *Women and Madness*, second wave feminist Phyllis Chisler (1972) poses the following questions:

1. Why are so many women in therapy, on psychiatric medications or in mental hospitals?
2. Who decides these women are mad?
3. Why do therapists have the power to deem a woman mentally ill when she asserts herself sexually, economically or intellectually?
4. Why are women pathologized but not treated when they exhibit normal human responses to abuse and stress—including the lifelong stress of second-class citizenship?

Chisler chronicles the stories of women who dared to be stubborn, aggressive, and/or express views different from their husbands and were subsequently 'treated' for

psychiatric symptoms. Two women, Ellen West and Sylvia Plath, eventually committed suicide; a third burned to death in a mental institution; and a fourth escaped after three years in an asylum. The last, subsequently published her experiences and began fighting "for the legal rights of mental patients and married women" (p. 46). Twenty-five years later, Chisler (1997) republished an anniversary edition, which reports that little has changed in terms of the oppression of women.

It is not only in the home, the courts, and the scientific communities where women's silencing takes place; it is a function of all social institutions combined. In an article on AIDS prevention, researchers discussed this very notion and highlighted the importance of understanding "how such gender norms affect women's silencing and the successful strategies that some girls and women develop to regain their voice" (Amarao & Raj, 2000, p. 734).

Educational institutions, one of the major social institutions in the U.S., and the one most responsible for legitimizing knowledge is likewise of guilty silencing women. Jackson (2004) devotes an entire volume to examining how women are silenced and devalued in academia, and Matton (2000) examines the "internal-discursive language of legitimation" (p. 152) within education. The fact that researchers in the 21st century are pointing to the need to examine how gender norms silence females is evidence that the problem of silencing still exists.

In an interesting aside, having the opportunity to voice desires and exercise autonomy has been shown to be something that even females of lower life forms respond to positively.

> The funny thing is, it appears there's a certain humanlike subjectiveness to the sex life of lab animals as well. When Jim Pfaus tested PT-141 on his female rats, he based his experimental design partly on the work of Raul Paredes, a fellow rat sexologist testing the effects of something more elusive: personal autonomy. That's a tricky thing to measure, but it can be done. Paredes did it like this: first, he looked at rat couples living in standard, box-shaped cages and recorded the details of their sexual behaviour. Then, he altered the cages in only one particular: he divided them into two chambers with a clear wall broken only by one opening, too small for the males to get through but just right for the females. Architecturally it was a minor change, but what it did for the females was huge. It let them get away from the males whenever they chose to, and thereby made it entirely their choice whether to have sex. Paredes then observed the rats' behaviour in this altered setting. Here's what he found: the effects of giving a female rat greater personal control over her sex life are essentially the same as those of giving her PT-141. Autonomy, in other words, is as real an aphrodisiac as any substance known to science. (Dibbell, 2006, para. 24-26)

Of course, my research is not about sexual choices of laboratory animals or even about the sexual choices of human females, but this very interesting animal study lends credence to how important the act of choice is upon living creatures, and for this researcher it incited a desire to more fully understand how different choices might affect women's learning and their technological self-efficacy.

Teacher Modeling

As we know from Bandura's (1977a) social learning theory, learning takes place

through modeling. Modeling is defined as "a process through which individuals learn behaviors, attitudes, values, and beliefs by observing others and the consequences of others' actions" (Chiou & Yang, 2006, p. 724). Within education, teachers are, of course, the primary models for students' behaviors. Research within social cognitive theory has demonstrated that "exposing children to adult models influences their self efficacy for learning and performing well" (Schunk, 2004, p. 115). Confident models generally raise self-efficacy, even when they fail while pessimistic models lower self-efficacy even when they succeed (Zimmerman & Ringle, 1981). For instance a confident teacher, even when she makes mistakes, raises students' self-efficacy while a teacher who lacks confidence, even when she succeeds at a task, lowers students' self-efficacy. For the purposes of this research, it was relevant to examine the existing literature on teacher modeling to see if there are any known correlations between teacher modeling and self-efficacy of adult students and/or between teacher modeling and socialization of students into traditional gender roles, which might impact women's self-efficacy.

In a study of parents' beliefs as predictors of children's concept of mathematical ability, Tiedeman (2000) discovered a relationship between parents' beliefs of gender stereotypes on mathematical ability and students' gender stereotype beliefs. The study found a statistically significant relationship between teachers' and students' beliefs of ability. The findings suggest transference of beliefs both from parents to student and from teachers to student. While this study was conducted on German students, there is little reason to suspect that a similar study on U.S. students would have different findings.

Research conducted on adults also found teacher modeling to be important to what students believed they could do well and what they actually did. In a study of

technology usage by pre-service teachers, researchers demonstrated that teacher modeling of technology is essential if the goal is to increase confidence and promote technology usage (Pope, Hare, & Howard, 2002).

Henschke (1998b) not only agrees that teacher modeling is important in adult education, he believes that it is the single most important factor in facilitating adult learning. "I have observed, in almost a quarter century of preparing adult educators to help adults learn, that the validity of teaching ultimately derives from a single element: modeling" (p. 11). Henschke reminds us of two things. First, many great teachers modeled the attributes that they were trying to teach—Moses, Confucius, Abraham, Socrates, Jesus Christ, and Tullius Cicero, who modeled, respectively, the law, thinking, faith, questioning, love, and oration. Second, Henschke reminds fellow adult educators that, "We are models. Students learn more from our actions than from our words. They want to see if our actions match our words" (p. 12).

The importance of modeling for adult educators is also an integral component of the Henschke's (1989) Modified Instructional Perspectives Inventory (IPI). The IPI examines the "beliefs, feelings, and behaviors of beginning or seasoned teachers of adults" (p. 1). The usefulness of the IPI for graduate education is discussed in *Development and Use of the Instructional Perspectives Inventory in Graduate Adult Education* (Henschke 1994), and is validated by Stanton's (2005), *A Construct Validity Assessment of the Instructional Perspectives Inventory*.

Schunk (2004) asserts that modeling, in general, is an important contributing factor to efficacy. "People acquire information about their efficacy in a given domain from the . . . observations of models (vicarious experiences). . . . Students acquire much information about their capabilities through knowledge of how others perform" (p. 113).

Specific to technology, Schrum (1999) suggests that modeling is an essential component of increasing comfort of and promoting more positive attitudes towards the use of technology, and Rogers (2003) lists observability of others' results as a key component in the choice of whether or not to adopt technology.

Specific to technology usage, Hickman, Bielema, and Viola (in press) have found that teacher modeling has a positive impact on teacher's use of technology in their praxis:

> Preliminary evidence from the participants of the Transition to Teaching Program at the University of Missouri-St. Louis indicates that students not only absorb the course content, but how it is delivered also serves as a model to them to change their own instructional behavior by incorporating increased technology with their own students. These findings are consistent with earlier findings by Hickman (1993) that instructors will likely use technology to enhance student learning if they believe they have the skills to do so (e.g., it has been properly modeled for them), and they believe positive outcomes will follow. (p. 4)

Of the 38 participants in the study, 22 (58%) indicated that "because of their exposure to technology in their program, they were either in the planning stages or had already adopted technology-assisted learning in their own classrooms" while another 9 (24%) "had their curiosity piqued," and 7 (18%) "indicated they already used technology extensively" (p.5). Only 6 (16%) "respondents said their program did not inspire them to change their own use of technology in their own classrooms" (p. 5).

The intersection of gender roles and teacher modeling. For women, it is not just what adult educators do that they notice; it is who the adult educators are.

> The presence of women faculty can be an important factor in supporting women's learning. A program with a minority of women students typically has a correspondingly low proportion of female faculty. . . .Women faculty may also serve a critical function as role models and mentors for women students. (Hayes and Flannery, 2000, p. 32)

In the case of female adult learners, simply having instructors with whom they can relate seems to be as important as what those instructors actually do in the classroom. Perhaps this is because so much of what we learn to do, we learn by watching others in their social roles, therefore, it is important for students to see others like themselves in the roles they wish to fill.

In *Transformative Dimensions of Adult Learning*, Mezirow (1991) discusses social roles and how they create a hierarchy: "Socialization involves inherent inequality" (p. 2). Mezirow continues, paraphrasing Bowers (1984), "Socialization involves internalizing the definitions, assumptions, and arbitrary typifications taken for granted and communicated by significant others. The image of an autonomous individual free from oppression is thus illusory" (p. 2). This is a Catch-22 for adult learners in formal education who wish to be autonomous but can never truly achieve such a state by virtue of the hierarchy that is U.S. higher education. Certainly, adult educators can assume the role of a learning facilitator rather than a an all-knowing purveyor of knowledge, but ultimately, the instructor, even with the students' input, ultimately has the greater authority and power both in the classroom and within the larger institution. Despite the adult educator's best intentions of creating an environment of mutual respect and trust,

the hierarchy still exists and those with the lowest status are painfully aware of where society situates them.

Andragogy

The term andragogy is believed by some to have first appeared in 1833 in Alexander Kapp's study on adult education and learning (Savićević, 1991), but Henschke (1998a) emphasizes that the concept can be traced back to ancient Greece and Israel. It is Malcolm Knowles (1970), however, who is responsible for popularizing the term in U.S. adult education as "the art and science of helping adults learn" (p. 38). Knowles (2005) admits that andragogy has implications for teaching children as well and lists six assumptions that differentiate adult learning characteristics from children's.

1. Adults' self-concept moves from dependency to one of being self-directed.
2. Accumulated experience increasingly becomes a source for learning.
3. Adults' readiness to learn is increasingly driven by social roles.
4. Learning moves from a subject-centered to a problem-centered orientation.
5. A motivation to learn
6. Need to know

The first four assumptions were in Knowles' original theory and the last two have been added in recent years (Knowles, Holton & Swanson, 2005). Each of these six assumptions may have implications for women's TSE in a patriarchal society and is examined separately.

Women and Andragogy. According to Knowles' first assumption, as humans mature, they move from a state of dependency towards adult independence, but, in

reality, this is far less true for U.S. women than men. In research that was funded by the United States National Institutes of Education (NIE), Holland and Eisenhart (1990) studied randomly selected women at two southern universities to determine why so few were entering the fields of science and mathematics. What they found is this:

> By the time [the women] left college, they had arrived at practices . . . that are key to sustaining women's subordinate positions in the society. Most had ended up with intense involvements in heterosexual romantic relationships, marginalized career identities, and inferior preparation for their likely roles as future breadwinners. (pp. 3-4)

The study showed that the women began to rely more on their romantic partners and less on themselves. This was despite the fact that the "sample was skewed toward women with strong academic records and career aspiration" (p. 3). When analyzing interview transcripts from 23 participants, Holland and Eisenhart found that women's heterosexual relationships and the analyses of these relationships were paramount to their personal and academic lives. This was especially true for the women who eventually disassociated from learning. In contradiction, then, to Knowles' assumption that adults move from dependency to self-directedness, the women in this study became more dependant and focused on men as they progressed through their college careers and less self-directed in their own educational endeavors.

It is important to note that Knowles (1970) does not say that the move to self-directedness is automatic; in fact, he cautions that adults often resist becoming self-directed, and he hypothesizes that resistance to self-directedness may be a "carry over from [the student's] previous experiences with schooling" (p. 40). In the Holland and

Eisenhart (1990) study, there was no indication that the female students resisted becoming self-directed. In fact, based on their statements entering college, many appeared quite self-directed initially, but then later lost that self-directedness. The researchers contend the following:

> The women's experiences in the world of romantic relationships both affected and were affected by their experiences with schoolwork. In a number of cases we saw women's career identities erode: those with the 'doing well' [receiving good grades and accolades] interpretation did less well in classes than they expected to, and those with the 'getting over' [doing the bare minimum to get a degree] interpretation became more and more bored with the seeming futility of schoolwork. As their career identities eroded, their focus on romantic relationships increased. Next their efforts at schoolwork decreased, then their focus on romantic relationships further increased. (p. 213)

Self-directedness can also be seen as power. In *Expanding the Boundaries of Transformative Learning: Essays on Theory and Praxis*, O'Neill and O'Sullivan (2002) define power as the "capacity for self-definition and self-regulation; access to resources, including mutuality; and degree of conscious participation in decisions affecting day-to-day living" (p. 180). Such a definition would be consistent with the findings of Holland and Eisenhart (1990), wherein many of the participants relinquished the power over their learning and lives to their heterosexual romantic partners.

While it certainly would appear that involvement in romantic relationships affects some women's self-directedness, there may be more to it than that. One difference noted in the women who maintained their self-directedness was their attitude towards learning.

The women in the ethnographic study were classified as "getting over," "doing well," or "learning from experts" (Holland & Eisenhart, 1990, p. 168). Only 18% of the women in the first two categories achieved their originally stated goals and pursued careers accordingly, while 80% of the women in the last category pursued theirs (p. 168). The women's level of self-directedness seems to have already existed upon entering college and remained static.

Some researchers find the very notion of self-directedness in a Eurocentric, patriarchal society problematic. In a chapter of *Confronting Racism and Sexism*, Daniel Flannery (1994) cites Clark and Wilson's accusation that the notion of self-directed learning (SDL) is both sexist and racist. "Learning theories based on individualism and autonomy reflect values and attributes that are primarily Western, white, middle-class and male" (p. 22). Flannery points out that different cultures place different values on self directedness and that even within the American culture, subgroups have varying normative ideas about the worth of self-directedness. Griffin (1983) concurs. "However scientifically grounded in psychological theory [this assumption] may be, it does seem to be excessively abstract and excessively culture-bound" (p. 54). More recent literature still suggests that some educational researchers consider the idea of self-directed learning to be culturally bound. Kerka (2005) writes, "proponents of SDL have been criticized for privileging Western values of independence, autonomy, and individualism and for ignoring sociocultural variations in approaches to education" (p. 1).

Brookfield (1993) finds more of a middle ground. Rather than suggesting that SDL is either oppressive or emancipatory, he admits that adult education is inherently political but asserts that it need not be tied only to the politics of oppression. Brookfield

posits that SDL could be made emancipatory. "Self-direction can be interpreted as an inherently political idea, an oppositional, counter-hegemonic force" (para. 3).

Holland and Eisenhart's (1990) study suggests that there is a correlation between involvement in heterosexual relationships and women learners' self-directedness, but is there more to it than that? One possible explanation for why women lose interest in higher education is the amount of attention that they receive in college compared to men. In a study at American University, researchers determined that female students received significantly less attention than their male peers and that sex bias continues (Smithson, 1990). Although this research is rather dated, the U.S. Department of Education (DOE) (2008) continues to provide grants for the purpose of creating gender equity in education. More specifically, the DOE funds the following types of projects:

- Training for teachers and other school personnel to encourage gender equity in the classroom
- Evaluating exemplary model programs to advance gender equity
- School-to-work transition programs
- Guidance and counseling activities to increase opportunities for women in technologically demanding workplaces
- Developing strategies to assist LEAs in evaluating, disseminating, and replicating gender-equity programs (para. 3)

Presumably, the problem of gender equity still exists since the Women's Educational Equity program had a budget of $1,879,440 for fiscal year 2007 (Women's Educational Equity, 2007, para. 11).

Another possible explanation for why women leave college less self-directed then when they entered is the impact of teacher attitudes and feedback. In analyzing linguistics studies that focus on writing styles between the sexes, Barnes (1990) points to research that (a) indicates boys are encouraged to try harder while girls are encouraged to accept less, and (b) females' efforts are not as highly valued as that of males. Under these circumstances, it is easy to understand how women might lose self-direction. Why pursue educational endeavors if little attention is paid to you, and when it is, your scholarship is devalued?

Part of the problem for adult educators whose aim is to be more sensitive to the needs of female and minority adult students is the lack of empirical research from the field of adult education in general, and on women and minorities in particular. "Although there is a substantial literature on andragogy, there is a paucity of empirical research on the subject" (Beder & Carerra, 1988, p. 75). Rachal (2002) indicates that while there have been some empirical studies in andragogy, mostly in unpublished dissertations, there has only been one in the last five years. The reason for this, he believes, is that there is no operational definition that researchers can use. This leaves those who are interested in further investigating the strengths and weaknesses of Knowles' assumptions left looking for relevant research in other closely-related fields.

One of the issues with empirically testing the assumptions of andragogy is that it is about more than a single testable technique. Strawbridge (1999) explains:

> Experimentally in an effort to control variables the researcher has to focus, almost of necessity, on instructional *techniques.* As noted earlier, however, if one compares an andragogical technique with a traditional technique *in the same*

> *class*, the result is something less than a robust andragogical instructional atmosphere. Andragogy includes a variety of techniques to be sure, but a sound conclusion about the efficacy of andragogy cannot be reached by merely comparing one technique with another, especially when there has been no uniform presentation of andragogy as an instructional context (Knowles, 1980). Seemingly, the best way to avoid these problems is to instruct an entire course andragogically in comparison to teaching an entire course traditionally. (p. 5)

In response to the dichotomy between those who "strongly favor Knowles' version of andragogy" and those who "dismiss Knowles' version of andragogy as being quite inadequate and unscientific," Henschke and Cooper (2006) respond, "most of the published material on andragogy that reaches beyond these limitations is largely untapped and not understood" (p. 1).

Women's Experiences. The second assumption of andragogy is that accumulated experience increasingly becomes a source for learning. Knowles (1973) felt so strongly about this assumption that he equated not valuing a person's experiences with not valuing the person. While this may seem to some like a personal statement that Knowles is using for the purpose of guiding his actions as an adult educator, he states unequivocally, "In any situation in which an adult's experience is being devalued or ignored, the adult perceives this as not rejecting just his experience, but rejecting him as a person" (p. 46). Adult educator, Vanessa Sheared (1994) expressed the beliefs that women's experiences are indeed devalued through the silencing of women and minorities.

> Since the1960s, historians, educators, political activists, and others have raised concerns that the contributions of women, African Americans, and other groups to

> the historical, economical, and political development of the United States are invisible. Studies on gender and race have shown that the exclusion of these groups from written texts has silenced their voices. (p. 29)

Other social scientists have also noted that women's voices have been silenced (Gabriel & Smithson, 1990; Giele, 1978; Holland & Eisenhart, 1990; Jónasdóttir, 1994).

The silencing of women and minorities has been so problematic in adult education that in 1992, the "Commission of Professors of Adult Education (CPAE) officially cited the exclusion of certain voices and knowledge bases within the adult education literature" (Sissel & Sheared, 2001, p. 3). Following Knowles' reasoning that not valuing a person's experiences is synonymous with not valuing the person, women are obviously devalued through the silencing of the voices and ideas, but women in the field of adult education are strong, intelligent researchers who will be heard.

In *The Politics of Transformative Feminist Adult Education: Multi-centred Creation of New Meanings and New Realities,* Miles, et al. (2000) challenge adult educators to become all inclusive:

> Adult Education in this period which aspires to do more than fulfill increasing government and corporate training needs in support of the destructive neo-liberal economic agenda is challenged to: 1) move beyond these false (patriarchal, colonial, ethnocentric, racist and anthropocentric) claims of universalism without succumbing to debilitating particularism or relativism; 2) 'offer alternative accounts of development' (Westwood); 3) pose/ foster alternatives to dominant profit-centred logics. (pp. 2-3)

The challenge that these female adult educators pose are important ones that are believed to be tied closely to this research on women's LTH.

In the theory of LTH, devaluing women's experiences and, by extension, their very being, is expected to contribute to women's beliefs about their diminished ability; these thoughts are, in turn, expected to play a role in decreasing women's TSE. Bandura (1977) points out that, "A theory that denies that thoughts can regulate actions does not lend itself readily to the explanation of complex human behavior" (p. 10).

Women's Readiness to learn. Knowles' (1970) third assumption is that adults' readiness to learn is increasingly driven by social roles. In contrast to children whose development is the product of physical and mental readiness, adults' readiness is based on evolving social roles. Knowles (1970) points to Havighurst's (1961) work in the field of adult social roles and lists 10 roles that adults fulfill throughout their lives: worker, mate, parent, homemaker, son or daughter of aging parents, citizen, friend, organization member, religious affiliate, and user of leisure time. The description of how these roles affect adults' readiness to learn is quite revealing in terms of how women (do not) fit into the assumption:

> In a person's role of worker, *his* first developmental task is to get a job. At that point, *he* is ready to learn anything required to get a job, but *he* definitely isn't ready to study supervision. Having landed a job, *he* is faced with the task of mastering it, so *he* won't get fired from it; and at that point *he* is ready to learn the special skills it requires, the standards that are expected of *him*, and how to get along with *his* fellow workers. Having become secure in *his* basic job, *his* task become one of moving up the occupational ladder. Now *he* becomes ready to

> learn to be a supervisor or executive. Finally, after reaching *his* ceiling, *he* faces the task of dissolving *his* role as worker—and is ready to learn about retirement or substitutes for work [emphases added]. (Knowles, 1970, p. 46)

While it may be safe to assume that Havighurst uses only masculine pronouns because the text was originally written in 1961 before educators began giving credence to the notion that white men's experiences were not universal, closer examination reveals that there is far more sexism in this passage that Knowles chooses to include in his book than just the exclusive language.

Nothing in Havinghurst's androcentric passage even hints at how social roles impact women's readiness to learn. Despite having listed roles such as daughter of aging parents and homemaker, which in 1970 was a term still reserved exclusively for women, there is no mention of how these female-typed social roles affect learning. Further, the linear career progression described was then, as it remains now, reserved for men. Women's career paths are rarely that linear because of societal pressures that maintain the status quo of women as primary care givers to young children and, in many instances, aging parents. In the role of caretaker to both younger and older generations, women are often forced to take time away from careers or to choose positions and paths that will allow them the flexibility to care for family but negatively affect their steady upward mobility.

Finally, contrary to the scenario described above, as women age, most do not concern themselves with substitutes for work, because women's work never ends. In the words of Gail Sheehy, "When men reach their sixties and retire, they go to pieces. Women go right on cooking" (As cited in Weekes, 2007, p. 87). I can honestly say that

in my entire life, I have never heard a single woman wonder aloud what she will do in her golden years. Like Sheehy, I attribute this to the fact that women already know what they will do—in most instances, it will be exactly the same things that we did before retirement, care for our families and friends, manage our homes, reconcile accounts, and expand our minds, only with reduced wages and benefits.

Women's Orientation to Learning. Knowles' (1970) fourth assumption is that as learners mature, they move from a subject-centered to a problem-centered orientation. Knowles claims that adults "tend to have a perspective of immediacy of application toward most of their learning" (p. 48). While I would agree that this is true in certain types of adult learning situations, it is far from true for *most* adults. Consider the growing segment of non-traditional college students as an example. These students typically work full-time and, therefore, need more time to complete their studies than younger adults who often have parental support. Further, this assumption is not true for most women. I went back to college over a decade ago with the full knowledge that it would take a very long time to earn my Ph.D. while working full-time and raising a family. I also knew that simply getting some additional skills for immediate use in my position at work would not make a meaningful difference in the salary that I could earn as a woman. I was painfully aware that it would take *years* to earn the credentials that would allow me to be competitive with men who had far less education and experience, and I would argue that I am hardly an anomaly. There is no doubt that earning power is related to race and gender (See Table 1). Women and minorities have to work harder than males and Caucasians. "Racial minority group members are overrepresented in the ranks of the working class and the poor. Women of any color or race living without a man are also more likely to be

poor" (Howard & Hollander, 1997, p. 22), a fact that government statistics have proven for decades.

It has been my personal experience and observation that females and minorities do have to work harder than males and Caucasians and others would agree (Burge & Lenksyj, 1990), but as an educator, you are not allowed to say that. I was fired from a

Table 1

Median Income by Race and Gender

Year	White men	Black men	Hispanic men	White women	Black women	Hispanic women
1970	100%	69.0%	n.a	58.7%	48.2%	n.a.
1975	100	74.3	72.1%	57.5	55.4	49.30%
1980	100	70.7	70.8	58.9	55.7	50.5
1985	100	69.7	68.0	63.0	57.1	52.1
1990	100	73.1	66.3	69.4	62.5	54.3
1992	100	72.6	63.3	70.0	64.0	55.4
1994	100	75.1	64.3	71.6	63.0	55
1995	100	75.9	63.3	71.2	64.2	53.4
1996	100	80.0	63.9	73.3	65.1	56.6
1997	100	75.1	61.4	71.9	62.6	53.9
1998	100	74.9	61.6	72.6	62.6	53.1
1999	100	80.6	61.6	71.6	65.0	52.1
2000	100	78.2	63.4	72.2	64.6	52.8
2003	100	78.2	63.3	75.6	65.4	54.3
2004	100	74.5	63.2	76.7	68.4	56.9

Source: Information Please Database

teaching position at a proprietary college for telling a group of mostly black women that they had to work twice as hard to prove themselves because they were black and women. As a bi-racial (Latina/Caucasian) woman, I know this is true and they knew it too; they just needed a reminder because many of them, by their own admissions, were getting lazy

in their studies. The question has been posed to me whether or not I think such statements support and reify unequal expectations for women. I do not; pointing out the reality of an existing disparity does not itself create or reinforce the disparity.

The irony is that as educators we are supposed to treat all students equally in terms of respect, and I did but was punished for it. It was a very small school and I knew these women on a personal level. I knew their struggles and I knew their dreams. I cared about these women like they were family, and I would definitely make the same statement to anyone in my family. The white administrator, concerned about possible backlash relieved me of my duties. Despite an overwhelming number of complaints from the students over my firing, I was not reinstated. The administrators were either unaware of or did not care about the reality of black women, which was captured well in this narrative of a black female professor trying to achieve tenure in the predominately white academy where she is employed: "The message, to be equal, you have to be better, is part of her ancestral legacy, and it is a constant life script the professional Black woman uses to pattern her life" (Alfred 2001, pp.121-122). I realize that many in the higher education system, despite the rhetoric to the contrary, do not want adult educators to treat all students with equal amounts of respect or candor, nor do they want us to promote social justice. As teachers, evidently, we are not supposed to educate the oppressed about their marginalized status, because they might start to believe it and demand change.

Women's motivation to learn and their need to know. Knowles' final two assumptions are that adults have motivation to learn that is different from children's and that adult have a need to know why they need to learn something. These two assumptions, which are closely related, were added in 1984 and 1989 respectively

(Knowles, et. al., 2005). Knowles posited that it was important for adults to understand why they needed to know something. He saw this as fundamentally different from pedagogy, wherein children simply learn because they are instructed to do so. Knowles also believed that adults are primarily intrinsically motivated to learn, whereas children are extrinsically motivated. I agree with these assertions but would take it a step further and say that traditionally there have been differences in the motivation to learn and need to know for women compared to men. Women's learning has, for the most part, centered around the home and family in different ways than men, which means that the motivations and needs have been different for each gender.

In pre-industrial times, families worked their lands together, but the women and men had distinct roles, with women concentrating on chores such as gardening, canning, sewing, cooking, laundry, and the care and education of children while men concentrated more on chores such as plowing fields, building structures, chopping wood, and trading livestock. During the industrial revolution, roles for men and women changed but remained distinct. "A nineteenth-century middle-class family did not have to make what it needed in order to survive. Men could work in jobs that produced goods or services while their wives and children stayed at home" (Lavender, 2003, para. 4). These changes gave rise to the cult of domesticity, which touted that "any good and proper young woman should cultivate piety, purity, domesticity, and submissiveness" (Lavender, Para. 6). This cultivation was achieved as "daughters were educated to be modest and virtuous, and young wives to be industrious and self-sacrificing" (Vallières, Boily, Poisson, & Larouche, 2008, para. 1). While women's roles are continuing to change in the

information age, they still remain segregated and this drives what women need and are motivated to study.

According to Hepburn and Simon (2006), "In the Western industrial democracies (the United States, Canada, Australia, and countries of Western Europe), women . . . work primarily in clerical, sales, teaching, and health care occupations (p. 63). The fact that women are clustered into lower paying jobs certainly suggests that what they are motivated to learn and what they need to know—either by choice or limited opportunity—is different than what men are motivated to learn and what they need to know to be productive in modern society.

As an adult educator, I do believe that Knowles' assumptions of andragogy have valuable implications for praxis, that is, the actual practice of teaching, separated from the theory of teaching. Specifically, I believe the following:

1. Adult learners want to be self directing. Society has created arbitrary social roles that make self direction more difficult for some, particularly those in groups that have been historically marginalized, but most adult learners desire autonomy nonetheless.
2. The experiences that adult learners bring to new learning experiences are valuable and should be recognized and used a basis for facilitating further intellectual and personal growth.
3. The social roles that adults have at any given time are the driving factor in what and how they choose to learn as opposed to physical and cognitive development being the primary factor for children's learning.

4. Adults have a problem-centered orientation to learning and typically learn best when they see a practical need for the knowledge.
5. Adults have motivation to learn that is different from children's. As a general rule, adults undertake learning by choice; whereas children learn because it is required both by their parents and the government.
6. Adults need to see the practicality and application of knowledge (albeit not necessarily the immediate application that Knowles posed).

Despite my belief in and practice of the general principles of andragogy, as a theoretical framework that can be applied to many adult learners, the fact that andragogy fails to take into account socialization into normative gender roles as dictated by a heterosexual patriarchy, leaves it incomplete. It is unrealistic to make assumptions about learners in isolation from the context in which the learning takes place. In fact, the first of Houle's (1972) seven principles of educational design is, "Any episode of learning occurs in specific situations and is profoundly influenced by that fact" (p. 32). Context is particularly important for women and minorities who receive disparate treatment in education, and researchers interested in the interplay between social context and learning outcomes often take a critical stance.

Critical Social Theory

Critical Social Theory, as defined by Max Horkheimer (1937), promotes the notion that we need to reduce the oppressive conditions of the status quo by pointing out inequities and actively working to eliminate alienation and domination. This is an especially important goal for feminist educators who want to "transform the production and dissemination of knowledge" (Lather, 1984, p. 50) from its current limited

Eurocentric and androcentric scope to a broader and more inclusive dissemination of knowledge, ideas, and experiences. Ironically, even critical theory, which purports to work towards abolishing the status quo, is not immune from hegemonic suppositions (see Freire, 1970; Habermas, 1987; Horkheimer, 1972).

Critical social theory, though moving in the right direction, is still replete with androcentrism. A cursory review of virtually any scholarly article on critical social theory reveals that an overwhelming percentage of the voices are males of European decent (Foucault, 1980; Habermas & Blazek, 1987; Horkheimer, 1972) and this phenomenon is not limited to the field of sociology; some critical theorists who focus on education are just as guilty of excluding the voices of the disenfranchised (see Freire, 1970; Kincheloe, 2004). They write from the standpoint of an expert informing academia and society of the needs of the oppressed *other*. Sadly, the existing power structure makes it very difficult for those belonging to marginalized groups to research and write about themselves, for when they do conduct such research, adding to it their unique and valuable insights as a member of that group, they are accused of bias, and the status quo is again reinforced.

Critical Adult Education. Freire (1970), perhaps the most well-known of all critical adult educators, introduced the idea of critical awareness in his writings on conscientization. Tennant (1997) interprets Freire's (1970) critical awareness to mean that the self is "a subject who can reflect and act upon the world in order to transform it" (p. 123). Freire believed in a transformative model of education as opposed to a banking model where teachers deposit knowledge and students withdraw it when and as instructed. He promoted the notion that adult educators have an obligation to (a) expose

the system for what it is, (b) make students aware of their role in a system that perpetuates oppression, and (c) encourage students to create positive social change. Freire's writings on conscientization focus on the authoritarian educational system and the belief that either education promotes freedom or domestication but it cannot be neutral.

Freire (1970), with his Marxist ideals of emancipating oppressed workers who are alienated from their own work, wanted to change the way that education socializes and controls the masses through consciousness-raising, but in his earlier writings he treated all oppressed workers as a unified group with identical problems and needs. Freire failed to consider that oppressed persons experience their oppression in different ways depending on what other groups each belongs to in addition to that of worker. Another failing of Freire was that while writing about how to help workers, many of whom had limited educations, he did so in an overly pedantic style. After receiving much criticism about both style and sexist language, Freire capitulated, requesting that future editions of his works eliminate sexist language (Schugurensky, 1998). The style, however, is still difficult reading, particularly for those without the benefit of a post-secondary education.

Realizing the affect that education has on perpetuating a society of workers who are complicit in their roles and in their oppression, Habermas (1987) built his critical theories upon Marxist ideals and provided adult educators with a theoretical framework that situates schools squarely in the center of society. In interpreting the works of Habermas (1984, 1987), Welton (1993) posited that human beings "have the capacity to become active reflective creatures . . . the conditions in our lives (the institutions and values that shape us) often prevent us from acquiring the competencies needed to develop

and unfold our many-sided potentialities" (p. 83). According to Merriam (1993) interpreted Habermas as having differentiated types of learning into technical, practical, and dialogic and believed that the primary goal of education should not be to produce complicit workers but to provide a climate that promotes emancipatory knowledge.

Building off Habermas' notion of transformation through emancipatory knowledge, Mezirow (1991) articulated his philosophy of transformative learning, which lies upon a continuum, and is defined as

> the process of becoming critically aware of how and why our presuppositions have come to constrain the way we perceive, understand and feel about our world; changing these structures of habitual expectation to make possible a more inclusive, discriminating, and integrating perspective; and finally, making choices or otherwise acting upon these new understandings. (p. 167)

While Jarvis (1983) agrees with Mezirow's philosophy of transformative learning, he disagrees with the assertion that these transformations fall upon a continuum, for if they did, it would stand to reason that the older adults are always wiser than younger adults.

Like Freire, Mezirow believed that transformation begins with a critical awareness. The primary difference between the philosophies of Mezirow and Freire is that Mezirow viewed transformative learning as a means of individual development, while Freire focused on transformation to produce changes in society at large (Lewis & Williams, 1994).

Although Freire, Habermas, and Mezirow are all considered critical theorists, they incorrectly assume that there is one *them* (the oppressors) and one *us* (the oppressed). Feminist scholars disagree, denouncing the idea of a unitary view of oppression and

pointing to multiple ways of knowing and experiencing the world. These multiple perspectives and the assumptions inherent in each are important because

> our basic assumptions about the nature of truth and reality and the origins of knowledge shape the way we see the world and ourselves as participants in it. They affect our definition of ourselves, the way we interact with others, our public and private personae, our sense of control over life events, our views of teaching and learning, and our conceptions of morality. (Belenky, Clinchy, Goldberger, & Tarule, 1986, p. 3)

It should be obvious that even within feminist frameworks, there are multiple theoretical perspectives that inform our understanding of learning; radical feminism is just one of these perspectives.

> In analyzing Freire's writing, Jarvis (1995) explains that education
> is a social institution which is controlled by the social and political processes which almost always automatically ensure that social pressures are brought to bear on learners to conform to what is socially prescribed in both cognitive and behavior dimensions. (p. 86)

While the idea of social conformity itself is not always a bad thing, it has been and continues to be used as a means of elevating certain groups while oppressing others, an ideology known as Social Dominance Theory (Sidanius & Pratto, 1999), which focuses on both individual and structural factors that contribute to various forms of group-based oppression.

> Social dominance theory views all of the familiar forms of group-based oppression (e.g., group based discrimination, racism, ethnocentrism, classism,

> sexism) as special cases of a more general tendency for humans to form and maintain group-based hierarchy. Rather than merely asking why people stereotype, why people are prejudiced, why they discriminate, or why they believe the world is just and fair, social dominance theory asks why human societies tend to be organized as group-based hierarchies. By framing the question in this way, social dominance theory . . . [focuses] on the universal and exquisitely subtle forms of discrimination and oppression that large numbers of people face in their everyday lives all over this planet. (Siddanius, Pratto, Laar, & Leving, 2004, pp. 846-847)

Social dominance theory is important for critical adult educators who wish to work to eliminate institutional discrimination, which appears not only in higher education but across many domains (Siddanius, et al., 2004). But if we, as adult educators, are going to point fingers at what needs to be done to correct discrimination, we had better start by looking at ourselves and the practices that we employ that perpetuate discrimination.

In *Defining the Enemy: Adult Education in Social Action*, Newman (2007) examines "the enemies within" (p. 47). He points to Cunnigham (1987) who "argues that adult education in North America is elitist, biased on behalf of the majority culture, and developing elements of coercion" (p. 48). Newman also directs attention to Carlson (1988) who lambasts the Council on the Continuing Education Unit for their attempt in 1984 to become the enforcers of what adult and continuing education professionals can and should do. As Newman aptly notes, this kind of thinking by the Council undermines the very heart of adult education, which should leave adults free to enjoy education in the

ways and in the places that they see fit without some council mandating how and where they should do it.

Radical Feminism and Technology. Technology, as with other areas of society, is not exempt from forces of patriarchal oppression. In *Feminism Confronts Technology*, Wajcman (1991) discusses the role that technology plays as a source of men's power over women, and points to "women's lack of technology skills as an important element in our dependence on men" (p. viii). Throughout the text, Wajcman examines "the impact of technological change on sexual divisions" and argues "that technology itself is gendered" (p. ix).

Wajcman's (1991) book was the first of its kind and scant studies have been conducted since that examine technology as means of women's oppression, making it difficult to either further support or refute the claim that technology is another way that women are oppressed in a patriarchal society. It is documented, however, that work for males and females has been separate throughout U.S. history (Ross, 2006), and I argue that because of this separation, women in the U.S. now find themselves poorly equipped to deal with the massive technological changes and are less able to compete for the higher paid careers in the male-dominated information technology (IT) field.

Lawley (1993) believes that one common form of technology, computer meditated communication (CMC) may lead to the eventual dissolution of arbitrary, socially constructed boundaries.

> These communication systems allow women to escape boundaries and categories that have in the past constrained their activities and their identities. By providing women with an opportunity to express their ideas in a way that transcends the

> biological body, this technology gives them the power to redefine themselves outside of the historical categories of 'woman,' 'other,' or 'object.' (para.1)

Providing a means where everyone—not just women—could transcend artificially constructed boundaries would be a step in achieving a more egalitarian society but not everyone believes that CMC will blur the boundaries between what is real and what is constructed.

Lawley (1993) relays the reaction of Carl Rosendahl, then president of Pacific Data Images, when he was asked whether the new computer technology that his company created obscures people's ability to distinguish fact from fiction. His reaction was to stand on a chair and shout empahatically, "No! No! No!" In response to this, Lawley writes:

> It is not surprising that the (male) president of this high-tech company is 'rankled' by this question about the blurring of boundaries. Contained in that concept is the seed of a true revolution in computers and communication: the possibility that it may no longer be possible to make judgments based on the physical and biological images before our eyes, that instead we may be forced to deal with shattered categories and shifting identities. And it is, without a doubt, those currently in categories that are accorded political and economic power—populated primarily by "men"--who stand to lose the most. (para. 31)

Only time will tell if Lawler's prediction is accurate.

Summary

The argument has been made that women's technological self-efficacy (TSE) is impacted by socialization into traditional gender roles in a patriarchal society. The

differentiated expectations for how males and females should look and act can be seen in the form of many parents' actions even before their children's births. These expectations are then reinforced throughout life, and may be affected by individual family values, media, law, science and medicine, and religious and educational institutions.

It was proposed that the socialization process directly impacts technological self-efficacy and when self-efficacy is negatively affected by past failures, either directly or vicariously, to the point that the user believes that future endeavors at using technology will also fail, it is seen as the psychological construct of learned technological helplessness.

The literature on learned helplessness, teacher modeling, and andragogy were all drawn from in an effort to highlight factors that might impact women's TSE. This was done in an effort to aid adult educators in identifying possible way to increase women's technological self efficacy through adult education teaching practices. Radical feminism viewed technology as yet another means of keeping women oppressed in a patriarchal society but also saw it as a possible means for blurring the artificial limitations that, in the past, have served to constrain female adult learners. Critical social theory suggested that we reduce the oppressive conditions of the status quo by pointing out the inequities in the current system.

Learned helplessness was examined as it relates to control in humans and was identified as the concept most closely aligned with establishing a new theory that might explain why a high percentage of female adult learners have low self-efficacy when employing technology as a learning and productivity tool. Teacher modeling was

examined as a contributing factor to learned technological helplessness because prior research indicates that much learning occurs through observation (Bandura, 1977b).

Knowles' (1970, 2005) theory of andragogy was described and the limitations of its four basic assumptions were exposed as insufficient for explaining women's learning because (a) the assumptions incorrectly place all adults on the same plane when women are, in fact, placed beneath men in U.S. society, and (b) socialization into distinctly different behaviors based on gender is not considered. Transformative learning was analyzed in an attempt to support the strengths and clarify the weaknesses of Knowles' assumptions as they apply to female adult learners. The strengths and weaknesses of critical social theory were examined as a way to move towards greater social justice in adult education.

Radical feminism viewed the role of separate spheres for men and women as problematic in keeping women ignorant of technology and out of the high paying IT jobs. One feminist suggest that technology may be blurring the boundaries of what is real and what is perceived or artificially constructed.

The next chapter presents the methods for exploring the phenomenon of learned technological helplessness and includes a description of the research participants, the sample size, and the instruments that were used to measure socialization into traditional gender roles, technological self-efficacy, and teacher modeling of technology usage. Finally, chapter 3 describes the interview process and the procedures that were used for analyzing both the quantitative and qualitative data.

Chapter 3. Methods

Chapter 2 synthesized prior research on socialization, learned helplessness, teacher modeling, and adult education and their perceived effects on technological self-efficacy in adult female learners. The argument was made that women learn to be helpless when utilizing technology because of the way that they are viewed and treated in a patriarchal society. At present, there are no studies that document or empirically measure these relationships. This study describes and measures the relationship between the dependent variable of technological self-efficacy and the independent variables of age and teacher modeling.

Laying the groundwork for a theory of learned technological helplessness that can be applied to adult female learners is an important step for adult educators in the digital age who wish to help women become fully self-actualized learners. This might be accomplished first by utilizing what is in the existing literature that is applicable to women's technological self-efficacy (TSE) and second by using the findings in this research to add to the current body of knowledge.

Participants

The research was conducted in three phases. The first phase was a pilot study designed to establish reliability and beginning evidence of validity on a created teacher modeling instrument (n=204). The second phase was the collection of the primary quantitative data (n=236). The third and final phase was the collection of qualitative data through interviews (n=3).

Phase One: Pilot Study

Phase one consisted of a pilot study for the purpose of creating a teacher modeling

instrument that was designed to show to how teachers appeared when using technology in the classroom, that is, what behaviors teachers modeled for their students. The pilot was designed to establish reliability and to establish beginning evidence for validity. The participants (n=204) in the pilot study on teacher modeling were a convenience sample of female students, faculty, staff, or visitors aged 18 and over who were in the education building of a Midwest research university. Necessary sample size was determined through commonly accepted statistical practices that call for 10-20 participants per scale item. The original scale had 8 items requiring a minimum of 80-160 participants. While there were participants who were either not connected with the education department or not associated with the university at all, the sample is believed to be relatively homogenous, consisting of mostly education students, faculty or staff. Some students were identified as being from other departments or from outside the university by statements that they made or through information they wrote-in on the instruments, but this variable was not tracked as part of the research.

Each participant was given an informational letter (Appendix L) that described the research, its intent, a description of any possible side effects, and a notification that they could stop at any time. For this pilot study, there were no anticipated side effects. The survey instrument took approximately two minutes to complete and was administered by the primary investigator (PI).

Phase 2: Primary Quantitative Research

Phase 2 consisted of collecting the quantitative data for the primary research study. Participants (n=236) were a convenience sample of women in the education buildings of two separate campuses of a public, Midwestern research institution, which

are geographically located several hours apart. The research was an inquiry into (a) participants' past and current behaviors when utilizing technology as a learning and productivity tool and beliefs surrounding such usage, (b) participants' affective traits, and (c) teacher modeling of technology. Demographics were collected to see if there were any correlations between age and TSE.

The two primary advantages of convenience sampling were cost and ease. The convenience sampling easily yielded the 160-200 participants that were determined necessary through a path analysis in SPSS. There was relatively little cost involved, even in purchasing the edible incentives that participants received. There is a limitation to this method, however, in that that bias that may occur when the sample is homogeneous, which this one probably is. This cannot be determined definitively, as participants were not asked what department they were associated with, if any. Some homogeneity is likely to occur because the samples were collected in only one building on each campus. Calkins (2005) provides the following good example. "Consider collecting GPA information from students in detention. It may be convenient, but perhaps not representative of the entire student body!" (para.1). All participants in the quantitative portion of the study were asked to complete an instrument that allowed them to self-identify for possible participation in phase three, the qualitative portion of the study.

The participants were given an informational letter (Appendix L or M, depending on location) that described the research, its intent, a description of any possible side effects, and a notification that they were free to stop filling out the instruments at any time and choose not to continue in the study. The instruments took approximately 10 minutes to complete and were administered either by the PI or a trained graduate student.

The instruments were administered over several days between approximately 11:00 a.m. – 1:00 p.m. or between 4:00 p.m. – 6:00 p.m. The reason for this time of day was that the time slots are near meal times and small edible incentives were offered, such as chocolate bars, granola bars, and chips.

Phase 3: Interpretive Understanding

For the qualitative portion of the study, participants (n=3) were purposefully selected from those participants who asked to be included in the pool and who reported beliefs that they have low TSE. In order to be considered as having low TSE, at least 4 of 7 of their answers on the Beliefs and Self-Selection Instrument would have to be answered in the affirmative (see Appendix G). This method was chosen because it would not benefit the research to interview participants who report high levels of TSE when trying to determine possible explanations for low TSE.

Once potential interview subjects were identified, they were contacted by the preferred method specified—telephone or e-mail—to determine their current interest level in participating. Before beginning the interview, participants signed two copies of a consent form (Appendix J or K depending on location), one of which was for their records, the other for the researcher's. Interview participants were compensated twenty dollars ($20.00), paid from the researcher's private funds, for an interview that lasted between approximately 1 hour. Interviews were recorded on a digital voice recorder and uploaded to the researcher's home computer as .wav files. Back-up files were made on the researcher's work computer. Both of these computers require passwords to access the system and any files on the system. Once the files were archived on the computers, the original recordings were deleted.

Interviews were transcribed by a paid assistant who has no association with the university or the participants. The electronic copies of the interviews are being stored with the same precautions as the .wav files and printed copies of the transcripts used for coding are being kept in the researcher's private home office.

Sample Size

A path analysis was conducted on the dependent variable of technological self-efficacy and the independent variables of age, teacher modeling, and socialization. Based on the analysis with these estimated parameters of power and effect size, the sample size for the analysis was determined to need a minimum of 80-160 participants. The final sample size, after eliminating those with missing data, was n=236. Additionally, in-depth interviews were conducted with 3 participants.

Instruments

Several instruments were used in this study. They are as follows:

1. The Bem Sex Role Inventory (BSRI) 30 question short form (Permissions letter, Appendix B) measures socialization into traditional gender roles. Using a Likert scale, participants rate themselves on a variety of affective traits, such as the five traits shown in Figure 3.

The BSRI is one of the most widely used measures of femininity and masculinity, but its validity has been widely contested. Choi and Fuqua (2003) conducted a metaanalysis of 23 factor analytic studies and found a mode of "one clean F [feminine] factor and two or more complex M [masculine] factors" (p.883). They concluded that the F factors were less complex than the M factors, but cautioned that this may be due to the homogeneity of the samples. "It is conceivable that the homogeneity of the samples led

1	2	3	4	5	6	7
Never or almost never true	Usually not true	Sometimes but infrequently true	Occasionally true	Often true	Usually true	Always or almost always true

1. Defend my own beliefs	
2. Affectionate	
3. Conscientious	
4. Independent	
5. Sympathetic	

Figure 3. Five item sample from the BSRI.

to the overly simplistic structure of the BSRI. Only 23% of the studies in the sample were noncollege samples" (p. 883).

A second important issue with the BSRI is the fact that it is a self-reported measure. How people rate themselves versus how others rate them on the same characteristic can be markedly different (Hegelson, 1994; Street, Kimmel & Komrey, 1995).

Brems and Johnson (1990) suggested that the BSRI be reconceived, perhaps as a measure of interpersonal sensitivity and interpersonal potency. Such a change seems more semantical than practical, as the suggested change would simply modify the labels of the feminine and masculine subscales, respectively, and not fundamentally alter the way that femininity and masculinity are measured. From the amount of debate that the BSRI has received, it may be time to measure the constructs of femininity and masculinity in different ways. Until such time as another valid instrument is created that makes that possible, the BSRI is, despite its flaws, the best instrument that is currently available for measuring femininity, masculinity, and androgyny.

2. A 10 question general computer self-efficacy (GCSE) measure, created by Compeau and Higgins (1995), which, as the name implies, measures general computer self-efficacy as opposed to application specific self-efficacy (see Appendix C).
3. A demographic information form was used to gather demographic information from participants (see Appendix D).
4. A five question teacher modeling instrument that was created specifically for this study for the purpose of measuring what effect, if any, teacher modeling has on students' technological self-efficacy (see Appendix F).
5. A seven question beliefs and self-selection form provided the researcher with a pool of interview participants (see Appendix G).

Socialization

Socialization into traditional gender roles was measured using the Bem Sex Role Inventory (BSRI). This BSRI has been used for over 30 years as a standard for measuring femininity, masculinity, and undifferentiated sex roles and is the best suited instrument for measuring socialization of women into traditional gender roles. The current marketers of the instrument claim that it "provides independent assessments of masculinity and femininity in terms of the respondent's self-reported possession of socially desirable, stereotypically masculine and feminine personality characteristics" (Bem, 2007, para. 1). The test-retest reliability with 28 males and 28 females has been shown reliable over a four week period with the following values: Masculinity r = .90; Femininity r = .90; Androgyny r = .93 (Holt & Ellis, 1998).

Technological Self-Efficacy

Technological self-efficacy (TSE) was measured using a General Computer Self-efficacy (GCSE) instrument from Compeau and Higgins (1995). Unlike many other instruments that only measure self-efficacy on a single software program, "the results [of the GCSE] should give one's self-efficacy (their perception of ability) for the entire computing domain (called general computer self-efficacy or GCSE, as distinct from spreadsheet (or database, etc.) self-efficacy)" (J. Downey, Personal Communication, November 12, 2007).

Compeau and Higgins (1995) indicate that their instrument has a high level of internal consistency; the internal consistency coefficient = .95. Evidence has been offered for criterion validity, such as the instrument relating negatively to users' anxiety, positively to users affect, and positively to outcome expectations and performance. Recall that "criterion validity refers to the relationship of scores obtained using the instrument and scores obtained using one or more other instruments or measures" (Fraenkel & Wallen, 2006, p. 151).

Teacher Modeling of Technology Usage

The use of technology as a learning tool is a relatively recent phenomenon and there is little research on the effects of teacher modeling of technology usage on students' technological self-efficacy. The few studies that have been conducted have been qualitative in nature. In a study of technology usage in pre-service teachers, Pope, Hare and Howard (2002) took a three-pronged approach to technology as a teaching tool, which included (a) teaching technology skills, (b) applying the learned skills in the classroom, and (c) modeling of technology skills by faculty. The researchers noted that

of the three, teacher modeling was the most important. It is not at all clear how the researchers arrived at this conclusion because the instrument that was used, asked no questions about teacher modeling specifically. I wrote to Dr. Pope on two separate occasions asking for clarification on this point, but received no reply.

In a similar longitudinal study conducted by Pierson and McLachlan (2004), pre-service teachers criticized how technology was modeled by their professors: "A common fault noted by respondents is that although professors did have expectations for student technology use to complete assignments, they did not see significant instructional use of technology in their coursework" (p. 12).

Hickman, Bielema, and Viola (in press) have also found that instructor modeling has a positive impact on teacher's use of technology. Of the 38 participants in the study, 22 (58%) indicated that "because of their exposure to technology in their program, they were either in the planning stages or had already adopted technology-assisted learning in their own classrooms" while another nine (24%) "had their curiosity piqued," and seven (18%) "indicated they already used technology extensively" (p. 5). These studies demonstrate the importance of teacher modeling both to students' ability to use and attitudes about technology usage.

Because technology usage as a common adult learning tool is relatively new, there are no established instruments that measure the effects of teacher modeling of technology on adult students' technological self-efficacy; therefore, I created my own instrument with the assistance of another doctoral student who currently teaches educational research and statistic courses (see Appendix E). I enlisted the aid of experts in the use of technology in education to verify that the instrument had good face validity.

The experts included a doctoral level IT Manager, a graduate level IT analyst, and two employees of a technology learning laboratory in a university School of Education. Following the confirmation of face validity, a pilot study (n=204) was conducted to establish the reliability and preliminary evidence for the validity of the instrument. The pilot consisted of an exploratory factor analysis (EFA) with 102 participants and a confirmatory factor analysis with 102 participants.

As a result of the EFA and CFA, the teacher modeling instrument was modified slightly. Directions for completing the instrument were changed, and the initial eight factors were reduced to five. The modified teacher modeling instrument is shown in Appendix F. The factor loadings are discussed in chapter 4.

SPSS was used to perform a confirmatory factor analysis (CFA). SPSS was also used to calculate the internal consistency of the scale. Internal consistency in the pilot study was .86. Internal consistency in the primary research study was .87. This initial step of establishing instrument validity can serve as a foundation for other researchers who want to study the construct of teacher modeling of technology.

Interviews

In order to add to the body of knowledge in the adult education literature, it is not sufficient simply to know the percentages of adult female learners whose TSE is affected by the independent variables of age, teacher modeling, and socialization into traditional gender roles, it is also important to know *how* and *why* TSE is affected. To that end, I interviewed three participants from a pool of those who self-identified as having beliefs and exhibiting behaviors consistent with the construct of LTH.

The interviews were semi-structured, which means that I had certain questions that I wanted answered, but let the interviews flow naturally, only asking questions if I needed to get to information that did not come out naturally. Examples of questions that I asked include the following:

- When you think of technology, what kinds of things come to mind?
- How do you use technology?
- How do you think you compare to others in terms of technological ability?
- Thinking about your teachers, can you talk a little about how they use technology?

The purpose of these types of questions is two-fold. First, I wanted to learn what women believe about their ability to use technology as a learning tool and second, I wanted to see to what extent the qualitative data converged with the quantitative data.

Analyses

The analyses of the primary study were conducted in two phases. The first phase consisted of a path analysis of the quantitative data. A more detailed description of the rationale for this choice is described in the *Quantitative* subsection immediately below.

The second phase of the analysis consisted of coding transcribed interviews for emergent themes. This process is described in greater detail in the *Qualitative* subsection below.

Quantitative

Path analysis enabled me to simultaneously calculate and model the relationships between the constructs. "A path analysis is used to test the likelihood of a causal connection between three or more variables . . . the essential idea behind a path analysis

is to formulate a theory about the possible causes of a particular phenomenon" (Fraenkel & Wallen, 2006, p. 340). Path analysis answered the following questions: "How are the variables related to one another?" "Does mediation occur?" "If mediation occurs, are there significant indirect effects?"

The advantages of path analysis over multiple regression are three-fold. As previously mentioned, it allows for simultaneous testing of the variables, rather than consecutive testing. It is a visual representation of the model. It allows for possible exploration of alternative models. The disadvantages of path analysis are that it assumes perfect validity of the measure, and the model fit is only good for this particular sample so caution must be exercised when generalizing.

Qualitative

The qualitative portion of the research relies heavily on phenomenology, which concerns itself with "studying everyday experience from the point of view of the subject" (Schwandt, 2001, p. 192). In order to analyze the interviews, they were transcribed and coded, looking for emergent themes using an a posteriori, inductive scheme, which is context specific. "Inductive logic is the science of discovery of facts not directly observable" (Ballantine, 1896, p. 1). The data was coded inductively line by line, paying special attention to key words that express emotions about the use of the technology or the technology itself. An excel spread sheet was created that listed each theme and the number of times that the themes occurred in each interview.

After the interviews were coded, I employed member-checking, which is a process wherein, I took my interpretation of the data back to the interview participant and asked her to verify that my interpretation of what she said and portrayed as her feelings is

indeed an accurate representation of that which she meant to convey (Schwandt, 2001). This is another form of triangulation that lends validity to the interview process and helps to ensures that interview bias is diminished to the extent possible.

Summary

This chapter outlined the rationale for choosing mixed methods to answer both the primary and secondary research questions. **Primary Question**: "Do age, teacher modeling, and the socialization of women into traditional female roles relate to technological self-efficacy in a way that is consistent with the construct of learned technological helplessness?"

Secondary Questions:

1. What are women's beliefs about how their socialization in a patriarchal society contributes to their own technological self-efficacy?
2. How have past experiences using technology affected women's current perceptions of their ability to use technology effectively?
3. How has teacher modeling impacted women's view of technology as a tool for learning and personal productivity?
4. What do women learners believe that adult educators can or should do differently to facilitate higher technological self-efficacy in women students?

In addition, research terms are defined in an effort to reduce ambiguity; this is particular important for the qualitative portion of the research, as some of the qualitative research terms do not have a single, universally agreed upon definition. The remainder of this dissertation is dedicated to a description of the research and a discussion of the findings and conclusions. Finally, suggestions for further research are offered.

Chapter 4. Results

This research attempted to lay the groundwork for the establishment of a theory of Learned Technological Helplessness (LTH), which is suspected to be influenced by the gender socialization of females into traditional gender roles in a patriarchal society. The purpose of this research was to determine if there is a link between women's technological self-efficacy (TSE) and (a) women's socialization into traditional gender roles, (b) age, or (c) teacher modeling of technology.

Quantitative Results

Quantitative data were used to measure the relationship between socialization and women's learned technological helplessness. Concurrently, the same constructs were explored using interviews with female college students in Missouri. The reason for using qualitative techniques along with collecting quantitative data is to bring together the strengths of both forms of research and integrate the results from two different perspectives.

Factor Analysis of the Teacher Modeling Scale

Using technology as an integral component in teaching adults is relatively new and there are no established instruments that measure the effects of teacher modeling of technology on adult students' technological self-efficacy; therefore, I developed my own instrument with the assistance of another doctoral student who currently teaches educational research methods courses. Several technology experts helped to establish face validity and a pilot study was conducted to establish preliminary evidence for the validity of the teacher modeling instrument. An exploratory factor analysis utilizing a sample of 102 participants was used to determine the factor structure of the administered

scale. Prior to running the exploratory factor analysis, the data was cleaned and the assumptions were tested. The assumptions were upheld.

A varimax rotation was used. Varimax is a variance maximizing procedure. "The goal of varimax rotation is to maximize the variance of factors by making high loadings higher and low ones lower for each factor" (Tabachnick & Fidell, 2001, p. 595). The factor analysis revealed that there were two primary factors that explained a significant amount of variance. Five items had factor loadings above .7, indicating a strong association with factor one; these items are:

1. Most of my teachers use/used technology competently.
2. The teachers that I have/had embrace technology.
3. My teachers say good things about technology.
4. My teachers often use technology in the classroom.
5. My teachers display a high level of confidence when using technology to teach.

One additional item had a factor loading above .4, indicating a moderate association but it was eliminated because it was also related to a second factor. See Table 2 for factor loadings. Due to the content of the actual questions, the resulting five items that were associated with factor one were selected to best represent teacher modeling of technology.

A confirmatory factor analysis utilizing an independent sample of 102 participants was used to confirm the factor structure developed with the exploratory factor analysis. The model can be seen in Figure 4. The results indicate an adequate fit of the model to the sample data (χ^2 (5) =17.02, p=.004, GFI = .929, CFI = .936, RMSEA = .155). Reliability analysis indicates that the scale has an internal consistency of .86. Based on

these results the five item scale was approved and used in the primary study. The modified instrument is shown in appendix F.

Table 2

Exploratory Factor Analysis Teacher Modeling Factor Loadings

Questions	Factor 1	Factor 2
Competent	0.808+	0.197
Effective	0.186	-0.616
Embrace	0.826+	0.283
Say good things about	0.715+	0.265
Raised confidence	0.469	*0.761
Used often	0.820+	0.257
Teacher's confidence	0.859+	0.206
Better use	0.148	-0.873

Note: +Factor 1 used; - Factor 2 did not use

*Ignored question because it loaded on both factors 1 & 2

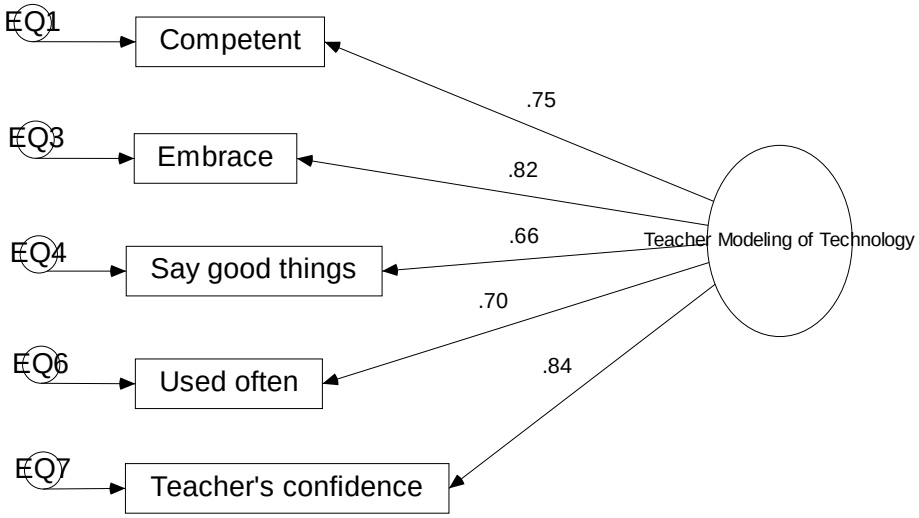

Figure 4. Confirmatory factor analysis for teacher modeling scale

Note: Paths are factor loadings.

Analysis of the Technological Self-Efficacy Model

Before the analysis was conducted, the data was cleaned with univariate and multivariate outliers removed. The inter-correlations between the primary variables (age, socialization into traditional female roles as determined by the BSRI, general computer self-efficacy, and teacher modeling of technology) were assessed and can be seen in Table 3. The inter-correlations indicate that the only statistically significant correlation among the primary variables is between socialization into traditional female roles and teacher modeling ($r = .134$, $p = .039$). Significance tells the researcher what the likelihood is that something happened by pure chance but it does not tell the researcher whether the difference is important.

Table 3

Correlations Between the Primary Variables

Variables	1	2	3	4
Age	1	.004	.047	-.003
BSRI Fem	.004	1	.117	.134*
GCSE	.047	.117	1	.008
TM	-0.003	.134*	0.008	1

*Correlation is significant at the .05 level (2-tailed)

A path analysis was used to address the primary research question of "Do age, teacher modeling, and the socialization of women into traditional female roles relate to technological self-efficacy in a way that is consistent with the construct of learned technological helplessness?" The researcher hypothesized that there is a relationship between teacher modeling of technology usage and TSE that is partially mediated by socialization into traditional female roles and there is a relationship between age and TSE

that is fully mediated by socialization into traditional female roles as seen in Figure 2 on page 11. The results indicate that the model is a good fit to the sample data (χ^2 (2) =.508, p=.776, NFI = .937, TLI = 3.201, RMSEA 10% confidence interval ranges from low = .000 to high = .085). Standardized results can be seen in figure 5. Despite the goodness of fit, the model does not support the hypothesis that socialization into traditional female roles mediates the relationship between age and TSE.

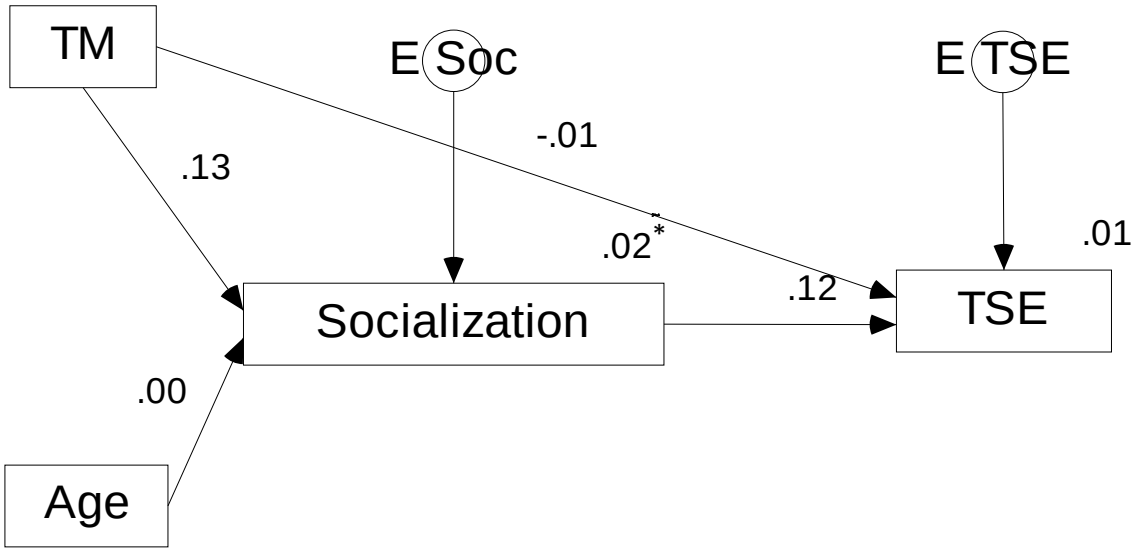

Figure 5. Path analysis of model 1

Note: Standardized Path Coefficients
TM=Teacher Modeling, Soc=Socialization, TSE=Technological Self-Efficacy
* Significant at p < .05

The results also do not support the hypothesis that there is a partially mediated relationship between teacher modeling of technology and TSE. Although the model appears to fit the data well, the squared multiple correlations—a measure of the total variance accounted for— of socialization into traditional female roles and technological self-efficacy (.02 and .01 respectively) indicate that the model is not a significant

predictor of either variable. These results do not support the construct of learned technological helplessness as it was proposed.

The demographics of the participants are shown in Table 4. They are as follows: 172 (72.9%) Caucasian/White; 43 (18.2%) African-American/Black; 5 (2.1%) Hispanic/Latino; 10 (4.2%) Asian/Pacific Islander; and Other 5 (2.1%).

Table 4

Frequency Table of Participants' Race

Race	Frequency	Percent	Cumulative Percent
Caucasian/White	172	72.9	73.2
African American/Black	43	18.2	91.5
Hispanic/Latino	5	2.1	93.6
Asian/Pacific Islander	10	4.2	97.9
Other	5	2.1	100.0
Missing	1	0.4	
	236	100	

Total years of formal education is shown in Table 5. The distribution is as follows: 55 (23.3%) High School/GED; 52 (22.0%) AA/AS; 69 (29.2%) BA/BS; 43 (18.2%) MA/MS; 11 (4.7%) Professional Degree; and 6 (2.5%) Ph.D.

Table 5

Frequency Table of Participants' Years of Education

Education	Frequency	Percent	Cumulative Percent
High School/GED	55	23.3	23.3
AA/AS	52	22	45.3
BA/BS	69	29.2	74.6
MA/MS	43	18.2	92.8
Professional Degree	11	4.7	97.5
Ph.D.	6	2.5	100.0
	236	100	

Table 6 shows the age range of the participants was 18-65, with a mean age of 30, a median age of 25, and a mode of 23. A table depicting every individual age is shown in Appendix A.

Table 6

Frequency Table of Participants' Ages

Age Group	Frequency	%	Cumulative %
18-22	71	30.1	30.1
23-27	72	30.5	60.6
28-32	20	8.5	69.1
33-37	19	8.1	77.1
38-42	12	5.1	82.2
43-47	14	5.9	88.2
48-52	14	5.9	94.1
53-57	7	3	97
58-62	6	2.5	99.6
63-67	1	.4	100
Total	236	100	

It was hypothesized that age would be a predictor of low TSE and the older the female, the lower her TSE. Age was not found to be a predictor of TSE, and the hypothesis that age could predict TSE was not upheld.

Upon further analysis, the intercorrelations between the individual BSRI characteristics and the participants' GCSE scores indicate that the conceptualization of socialization should have been expanded to include masculine characteristics. *Risk taking* for instance is a significant predictor of TSE at 0.274 and *dominant* is significant at 0.247 (Table 7); several other characteristics typically associated with masculinity are also significant predictors of TSE. These results suggest that certain characteristics may indeed be predictors of TSE, just not the ones predicted by the researcher. Having

feminine traits is not a deficit to TSE but having masculine traits is an asset to TSE, as shown in Table 7.

Table 7

Correlation of Gendered Traits to Technological Self-efficacy

Trait	r	Gender
Willing to Take Risks	0.274*	M
Define Own Beliefs	0.082	M
Independent	0.193*	M
Assertive	0.236*	M
Strong Personality	0.190**	M
Forceful	0.222**	M
Have Leadership Abilities	0.225**	M
Dominant	0.247**	M
Willing to Take a Stand	0.177**	M
Aggressive	0.246**	M
Affectionate	0.117	F
Sympathetic	0.006	F
Sensitive	0.070	F
Understanding	.166*	F
Compassionate	0.078	F
Eager to Soothe Hurt Feelings	.021	F
Warm	.198**	F
Tender	.100	F
Love Children	-.040	F
Gentle	.113	F

Note: * p<.05; ** p<.01; M = masculine characteristic, F = feminine characteristic

Qualitative Results

Three females over age 18 participated in the interviews. The interview participants each have different ethnicities, SES, and educations. Simone is a 23-year-old Caucasian from a blue-collar family. She attended private school most of her life and is currently a junior in college. Ann is a 24-year-old Hispanic, from a white-collar family. She attended public school all of her life and completed an Associate's degree. Desta is a

19-year-old Ethiopian immigrant, from a wealthy family. She attended public school all of her life and is currently a sophomore. (Real names are not used.)

Four key patterns emerged from the interviews that are consistent with the proposed construct of LTH. All three interview participants reported that they believed, based on their own observations and early personal experiences, males and females are socialized to interact differently with technology. All participants reported that as adult females they do interact with technology differently than the men in their lives. All three participants indicated a belief that women, in general, are less confident than men when using technology. The way that others teach—words, tone, body language, and patience—does impact students' feelings about their self-efficacy. Only one interview participant mentioned age a factor in female's TSE.

Pattern 1—Women's Socialization and its Intersection with Technology Usage

A count of socialization differences revealed that Simone mentioned disparate treatment 23 times, while Ann and Desta mentioned it 11 and 8 times, respectively. Of her experiences with differentiated socialization, Simone says, "My dad showered my brother with all types of technological games and systems when he was growing up, and I didn't really get to touch any of that . . . and then his interest grew with age."

Similarly, Desta reported that, there were definitely differences between her and her brothers:

Desta: Like I'm from Ethiopia and, like you know, the women kind of a depend on the men, you know. The women cook and clean, you know, so like I've always been around the kitchen area helping my mom and my sister and if I'm not helping, I have to watch or stuff, so maybe that's why.

Joy: How long have you been in the United States?

Desta: Mmm, 10 years.

Joy: Okay, so you've had a pretty long time since you…

Desta: Yea, but since it's like that in this culture kind of different, but still obey my family.

Joy: So even though you live in a new country, the expectations for what you are supposed to do haven't changed?

Desta: Mm-hmm, yea for example, like mowing the grass, like girls, they don't do it, so I expect certain things out of guys supposed to be doing, so if I have a computer problem, I expect them to help me out.

While Desta admits that her experiences are culturally based in Ethiopian socialization practices, these practices do not appear markedly different than those in the U.S.

Ann's experiences were a little different than that of the first two participants, as she has only sisters and no first-hand experiences of disparate treatment between the sexes at home, but Ann believes that there are differences between the sexes, which only manifest themselves in older adults.

Joy: Okay, so you think that 9 out of 10 men, approximately, and 9 out of 10 women can use technology, and only 10% are not comfortable with that, is that correct?

Ann: Yes, in, around my age frame, in, in their 20s probably.

Joy: And what about older men and women, do you think that it's comparable with them, as well?

Ann: I think older men are better with technology than older women.

Joy: Why do you think that is?

Ann: I really don't know. I just think that; I don't know why I think that. I think that men just know how to use technology better than older women. I'm not sure why I think that. I just do.

Joy: Where do you think the older men would have learned to use the technology better than women?

Ann: Maybe in the work place. Maybe I picture the older generation of like more men going out to work and women staying at home, and I picture this generation of, you know, there's a lot more career women then, I don't know the statistics, but that's just how I picture it in my mind. And so, if the women were staying at home, you know, and the older generations and guys were out at work then they had more hands on experience.

Pattern 2—Women's Beliefs About how They Compare to Others

One of the two foreshadowing issues discussed in chapter one was the expressed belief that those experiencing low TSE are more technologically inept than their peers. Each of the three interview participants compared themselves negatively to others in terms of her ability to use technology effectively. One participant commented negatively on her abilities 14 times, while another commented negatively 9 times, and the third commented negatively 2 times. What each participant had in common was the belief that her ability to use technology was inferior to that of her immediate male family members. Interestingly, even when the technological issues were in the traditional female domain, males still took care of it. Consider Ann's remarks:

Joy: A lot of appliances, now days have remote controls, washers and dryers that talk to each other with USB interfaces, microwaves that are programmable, anything that you might use on a daily basis, cordless phones…

Ann: I can use those things, basically, but if there's anything that needs to be programmed, I leave that up to my husband.

Joy: Can you talk about why you do that?

Ann: I do that because I feel like he's, he knows what he's doing more than I do. I think that if I—I feel that it will take me a long time to do it because I feel that I'm confused by it and that I have a hard time understanding. I have a hard time doing it.

Joy: Do you think he has an easier time doing it than you? Does he do it faster than you?

Ann: Yes, he definitely does it faster, but he also does it more frequently, so I think he's had more experience, so that makes it a little bit easier for him. But I'm also, I don't have as much experience but that's partly my choice, because, because I am scared of it. I don't do it as much, so that's partly my own fault.

Desta also relied on male family members to fix the technology for her, believing that she would not be good at it:

> I don't know. I just feel like a guy might know better in like technology. I don't know, I always think about that. They know more. Like they know how to fix the TV better than I do; I don't know how to fix TV; they know how to fix TV.

Simone had similar feelings about her inability to correct problems that she might encounter, whereas, her brother, she believed, would have no such issues.

My brother is going to school for computer engineering kind of stuff; he does it by himself. He reads MIT archives for fun, physics books for fun. Like he's a nerd, and compared to him, I feel like an ant in the world of technology.

Part of this lack of confidence in ability may be explained by the fact that some women do not feel that learning to use technology is priority, that is, they chose not to concentrate on learning to use technology. Two of the women felt that learning technology had not been and currently was not a high priority for them. It was easier and/or more efficient to rely on the men in their lives.

Ann: I know I could. I don't think I am a stupid person, but it's just easier to ask somebody else.

Joy: Is that an issue for you?

Ann: Yes, in some things, it's just not, I just don't consider it extremely important. Things that I consider extremely important in my life, I take a lot of time doing. If I don't consider it important, I blow it off. So, I guess it's just what I personally value.

Simone echoed the sentiment that learning technology was not a high priority. In her mind, **not learning** was the more efficient option.

Simone: It's been 100 years almost since, you know, women could vote and we're still not on an equal plane with men and it's been a 100 years almost, like what 80, 80 years? And we're just such a male dominated society and we've always been that way. And like I said, it's narrowing. I mean we can vote and we can own property and we can use technology, but I mean we're still not on the same pay level, we're still not held at the same regard as they are, we're still, I

mean it takes, when you're a woman and you're in a competitive field like business you have to prove yourself twice over, one that you're a capable human and two that you're a capable woman. You know? And I would hope someday that that gap would go away and we would all be equal, but I'm an optimistic, realistic person, and I don't think it will happen, at least in my lifetime.

Joy: That being the case, it seems to me that women would try to learn to use technology more, if they have to work that much harder than their male counterparts.

Simone: You would think, but if you could just make a phone call and ask your boyfriend for help, which is easier? Which is more instant gratification? Figuring it out by yourself after an hour or making a phone call and having it fixed in five minutes?

These statements from the interview participants indicate that there are indeed differences between these female and the males in their lives. Furthermore, the women do not see themselves as anomalies in this respect; rather, two of them believe that being male and being better at technology are the norm for all age groups and the third believes this is true, at least for the older generation:

Simone: All my friends are techno-tards.

Desta: I'm not so good at using technology. My girlfriends, they are all the same as me.

Ann: I think that men just know how to use technology better than older women. I'm not sure why I think that, I just do.

The idea of age as a predictor of TSE, that Ann mentioned, is consistent with the construct of LTH, but the quantitative data in this study did not find age to be predictive of TSE.

Pattern 3—Women's Confidence in Interacting With Technology

The second foreshadowing issue discussed in chapter one was that of making self-deprecating remarks about one's ability to use technology effectively. A count of the patterns showed that two of the three participants rated their interactions with technology negatively a total of nine times each while the third participant rated her interactions with technology negatively five times. The participants considered their abilities inferior both to males and other females. Consider Simone's remarks when asked about her Internet connection:

Joy: Do you have DSL? How do you connect to the Internet?

Simone: Umm, yea, DSL, my brother does all that. He's actually is kind of a Nazi about it; you can't eat by the keyboard. You have to have headphones on at all times. We had a router, but we had a big thunderstorm over the summer, and, I don't know. See, this is why I rated myself low. I don't know any technical terms; I don't feel like, with anything other than, like if my brother asked me about a cell phone, like he would come to me if he had questions about a cell phone and I would help him. I go to him when I'm like anything else. If I have word processor problems or if I can't connect or if something is not loading, I'll call my brother.

Simone also relied on her best friend, a female, for technical support. Of her friend, Simone had this to say:

> Compared to her I can't do anything. . . . Out of all of my friends, the only one, the only female that I know that can do a technological task, with confidence, is my lesbian best friend. All my other girlfriends always call their boyfriends for help with that.

Ann also relied on others because she believed that her skills were inferior, but in her case, the *others* were all females:

Joy: Now you mentioned that classmates would help you when you were in school. Were there laboratories or other centers were you could go and ask first?

Ann: Yes, there were.

Joy: Did you ever go to those?

Ann: No, I didn't. If I had questions I had, I have three sisters, two older and one younger, and all of them know more about computers than me. So if I ever had a question I could just ask any one of them. So, I generally wouldn't stay after school I would just have them help me at home or a friend or something like that.

When asked why she thought her sisters were both competent and confident in using technology while she was not, Ann responded, "I slacked off during the important years or um a couple, a couple of the years where I was really should have been learning how to use computers."

Desta saw a clear delineation between the sexes in terms of technology usage:

Joy: When you think about the other female members of your family or your classmates, do you see any difference between men and women's use of technology, generally speaking?

Desta: I see, yes, yes, the female, well I don't know about most of my friends, but like the female members of my family, they have no clue about computers or other technology like, or my mom, like if she needed help how to figure things out on the computer, you know, like she'd ask for help, yea. But some of my friends know, they only use computers for certain things or phones just call, so like they don't spend that much time actually, you know, trying to figure out this technology thing.

Desta's last statement that her female friends "don't spend that much time" trying to figure out technology is consistent with Simone's and Ann's statements in the previous section.

Pattern 4—Teaching Technology

While the overarching purpose of examining teacher modeling was to see if and how modeling in the formal classroom affected women's TSE, some of the women's statements surrounding informal teachers are also important and are included in this section. For the purposes of this study, an informal teacher is any adult who teaches another adult in a setting other than an educational institution. There was some poor teacher modeling of technology in formal classroom settings, but the issues had just as much, if not more to do with students' fears—including the fear of appearing ignorant, fear of not grasping the technology quickly enough causing teachers to grow impatient, and fear that they would require too much repetition to understand instruction on use.

Participants also discussed how teachers' behaviors in informal settings affected them. Non-classroom issues that participants mentioned included being talked down to,

body language that indicated impatience, and others doing for them rather than teaching them how to do for themselves.

Formal classroom teacher modeling. Participants reported that teachers either (a) did not use technology at all or (b) relied so heavily on it that they could barely teach without it. Neither of these scenarios indicates positive teacher modeling of technology.

Joy: Think about your education, the teachers that you have in your classes.

Simone: Right now?

Joy: Well, not just right now, but just think back over, say, the last 10 years.

Simone: I went to private school; we didn't have any technology at all. The main thing we had was overhead projectors and chalk. We had CD players but we didn't really use them for very much. When I went to high school, I went to [deleted] Academy and most of the time technology was downgraded as something that didn't always work, so you should always have a backup plan so we did a lot of transparencies, a lot of outlines, not a lot of PowerPoint. PowerPoint didn't even get big, with me, until after— I went to community college for two years, after community college when technology was really expressed as an educational tool. Up until that point it was kind of optional. It was a big deal if someone brought in a PowerPoint. It was like "Wow! You got that to work!"

Joy: And was it just static slides, just pictures and words and nothing else?

Simone: Yes, I saw my first impressionable PowerPoint my freshman year here, 'cause I'm a transfer student, and someone did one with sounds and links to YouTube and I was like "I didn't even know you could do that." I thought that

was pretty cool. I was like "Wow! I'm gonna play around with that and see how that works."

Desta, on the other hand, reported that her teachers rely so heavily on PowerPoint that class can barely go on in a coherent manner if the technology is not working correctly.

Joy: So think about the teachers that you've had since you moved to the U.S. Do they use technology in a way that encourages you to want to use more technology?

Desta: Yea, like my teachers, I don't think they could do lecture without a computer. Whenever one time, here in this building, I had psychology and the computer shut down on her and she had to lecture by hand and she was not comfortable. And she had to send us the notes and stuff like that so it's like, some of the teachers kind of get bothered if they cannot use the computers, so it was telling me like "Oh this must be really important" you know?

Joy: Do you think that that actually enhances their ability to teach or do you see that as a crutch?

Desta: Sometime, well she's actually good, she's a good teacher and lecturer and all that, but without the computer, because we have to fill in the blanks while she lectures so it's kind a like, "What are we supposed to fill in the blanks with, you know we can't see it and it usually be on the PowerPoint" so it's kinda like, "Oh my gosh" it was like a little break down.

Joy: So do you think that she is capable enough in her field that she could just stand in a room with nothing and lecture to you and teach?

Desta: She was comfortable but at the same time it was hard for us to follow her because we didn't know what we supposed to fill in the blank, like you know?

Interestingly, Desta indicated that many of her college instructors have a total dependence on technology in order to teach class, yet she rated her instructors' average at 4.5/5.0 on the Teacher Modeling instrument. Desta also stated that none of her instructors use anything except static PowerPoint slides, something that second and third-graders routinely do these days, indicating that there is much educational technology to which she has not been exposed.

Ann rated her teachers as average, did not really speak to their modeling of technology, and believed that because she "only took general courses" that there "wouldn't be much technology in those courses anyway." Ann did speak at length about her fears about learning to use technology and what she would need in order to feel comfortable in the learning process:

Joy: Did you ever notice how comfortable other women in your class felt using technology. Everybody knew how to do it except you?

Ann: That's what it felt like to me, yes. So which even made me more scared because I felt stupid asking questions about it because it seemed like everybody else knew and I didn't. That was just my impression though. I really don't know. I didn't ask them. But it just seemed like everybody else knew what they were doing.

Joy: So anytime you would ask somebody else a question, they always had the answer?

Ann: Um, I can't definitely say yes for sure. But I always ended up getting the help I needed from somebody. I don't know that, it seemed that everybody knew what was going on but me.

Joy: If someone came to you and asked you for help and they didn't know how to do, what would you think of them? Would you think they were stupid?

Ann: No, I don't think so.

Joy: But you feel like if you can't use technology then other people will think you are stupid, is that correct?

Ann: Um, yes, I suppose so.

Joy: If you would not think somebody else was stupid because they don't know how to do something, why do you think people would think you're stupid if you don't know how to do something?

Ann: Because, I guess, I would just feel like um, it's something that's so simple that everybody knew how to do it except me, so I don't know, maybe just being self—what's the word—self-conscious?

Joy: Can you think of an environment where you would not be self conscious? Where you would be comfortable asking for help learning to use technology?

Ann: Well I'm comfortable asking people in my family. I wouldn't be comfortable going into a library and asking somebody to help me or um somebody who didn't know me. I wouldn't be as comfortable because I feel like I would have to ask too many questions and I wouldn't get it as quickly as I should, and maybe they would think that I was stupid. But my family, I feel like I could ask them a hundred times and I don't care if I get on all their nerves.

Joy: What if there were a place on campus where that specifically was their job to help people use technology? If you could make an appointment and go in and see somebody and have them sit with you and perform some tasks and do it repeatedly until you felt comfortable. If a place like that existed would you do it?

Ann: Um, I suppose if I needed the help, but it would also depend on the people that were there because sometimes no matter what type of class or course that's being taught if you don't feel comfortable with the teacher or if they, if you're getting signals, maybe not verbally, but you know if they're like sighing or they seem like they're getting frustrated or their body language, then I wouldn't feel comfortable to keep asking questions. If they made me feel really really comfortable, then I think that it would be a lot easier for me to continue doing something like that.

Joy: So, you mentioned some specific things. Body language would be a cue to you that someone might not be patient. What kinds of things would they have to do with their body to make you feel comfortable?

Ann: Um, maybe instead of just coming over and standing over me and looking down, like if they would sit down with me, and I would feel like they were taking the time out to sit with me and really talk to me. If I didn't feel that they were trying to, if I didn't feel rushed. If I felt like they were actually taking time. If there were a whole bunch of other students in there and they were just walking around doing, you know answering questions. I just feel like I would have to have a lot of one on one time to really feel comfortable.

Simone also mentioned the fear factor in women. "It's not to say that I don't think that they [her friends] can't do it, I think that they're, that they're just afraid that they're gonna do it wrong."

Informal teacher modeling. Two of the participants talked about their interactions with informal teachers. Simone had this to say about her brother, who has taught her much about technology:

Simone: And he'll call me an idiot and tell me that I'm disrespecting technology because I don't understand how it works. But then he'll begrudgingly explain to me, in big long words, what's going on and how I can fix it.

Joy: So how does that make you feel when he talks down to you like that?

Simone: Like I'm an idiot.

In contrast, Ann believed that her lack of TSE had more to do with people always doing things for her rather than teaching her to do for herself.

Joy: Have you ever heard the term, learned helplessness?

Ann: No, not until you brought it up a few weeks ago.

Joy: Do you remember what learned helplessness is?

Ann: Um, basically, my understating is exactly what it says, you learn to be helpless.

Joy: Do you think that that describes you in terms of technology usage? Do you think that you have learned to be helpless?

Ann: In terms of technology, definitely, 100%.

Joy: What kinds of things do you think contributed to your learning to be helpless in using technology?

Ann: Um, I think that I learned to be helpless with, in the aspect of technology because if I ever had a problem or a question with something about technology, I would, I would ask somebody and they would do it for me, I would just let them do it for me, instead of actually learning it myself, and when people continued to do that over and over again over months and years, then eventually I just started to depend on people doing it for me instead of myself.

It may be tempting to think that humans are born helpless and that individuals can either learn or chose to stay helpless, but Seligman and Maier (1967), Hiroto (1974), and Mikulincer (1994) demonstrated empirically that both animals and humans can be taught to act helpless, even when they have the ability to control situations.

Summary

The quantitative data do not uphold the assumption that having more traditional female traits makes one less efficacious in using technology. Based on statements by the interview participants, however, there does still seem to be something happening that leads a segment of women to interact less effectively with technology than the men in their lives. In some instances, it is a conscious choice to not learn, but the participants all indicated that whether the choice was conscious or not, they still thought the men in their lives were simply better at interacting with technology than they were. Based on the statements from these participants about their individual experiences and observations, there does seem to be a phenomenon that involves some women believing that they have lower technological self-efficacy than men, and this merits researching further to get to the causes. Second, there is another possible explanation for the failure to find a link

between feminine traits and low TSE and that is that those in the sample may have overestimated their own technological abilities. This phenomenon is discussed in Chapter 5.

Chapter 5. Discussion

During interviews lasting approximately one hour, three women, each of whom rated themselves low in technological self-efficacy, shared their observations about and experiences with using technology as a learning and productivity tool. This information is used in combination with quantitative data (n=236) to examine a proposed construct of learned technological helpless as experienced by adult female learners. This chapter reminds the reader briefly of the problem, researcher's underlying assumptions, research questions and hypotheses, and results of the data analyses. The implications of the findings are explored, and suggestions for future research are made.

It was hypothesized that (a) There is a relationship between age and women's technological self-efficacy that is completely mediated by socialization into traditional female roles; (b) There is a relationship between teacher modeling of technology usage and technological self-efficacy that is partially mediated by socialization into traditional female roles; and (c) There is a correlation between women's past failures using technology and their beliefs about current technological self-efficacy. In my roles as a corporate trainer and as a college educational technology instructor, I have observed a trend of competent women learners exhibiting disbelief in their abilities to attain proficiency in using technology as a learning and productivity tool at an alarmingly high rate compared to their male peers. Based on numerous conversations, over more than a decade, I have come to understand that for many of these women, past failures when using computers or other technology have led them to believe that future attempts at using technology will also fail; as a result, they simply stop trying. This current research study was undertaken in an attempt to understand this phenomenon and begin building a

theory of Learned Technological Helplessness (LTH), using the existing theory of learned helplessness (LH) as a foundation.

This research was conducted primarily using quantitative methods but qualitative strategies were also incorporated to further examine the phenomenon. It was hypothesized that the data that emerged from the interviews would converge with the quantitative data; however, this was not the case. The interview responses, although consistent with my observations as an adult educator, diverged from the quantitative data obtained.

There were three assumptions that I made as I undertook this research. Each of the assumptions, the findings, and implications of those findings is discussed separately.

Assumptions

1. The construct of LTH is more prevalent in women who are socialized into traditionally female roles than in those who are not.
2. The attitudes, beliefs, and choices surrounding technology, held by role models, will transfer, at least partially, to female learners' attitudes, beliefs, and choices surrounding technology.
3. Socialization varies by age, and older women are more likely than younger women to exhibit behaviors consistent with the construct of LTH.

Assumption 1

The construct of LTH was not found to be more prevalent in women who were socialized into traditionally female roles. Traditional female socialization was measured using the Bem Sex Role Inventory (BSRI) femininity subscale. No correlation was found between scoring high on the femininity scale and scoring low on technological self-

efficacy (TSE). However, a positive correlation was found, between the BSRI masculinity subscale and the TSE scale. Women who scored higher on the BSRI masculinity scale also scored higher on TSE. These results suggest that having more traits typically associated with being female **does not predict reduced** women's TSE, but having more traits typically associated with being male **does predict increased** women's TSE.

The quantitative findings indicate the hypothesis that socialization of women into traditional female roles relates to technological self-efficacy was not confirmed. This is a divergence of the data from two of the three interview participants, Simone and Desta, who reported they felt that they were socialized to interact with technology differently than their male siblings. Ann, on the other hand, had only sisters, and she attributed her low TSE more to her lack of effort and choice to let others complete tasks for her.

Assumption 2

There is evidence to support the assumption that the attitudes, beliefs, and choices surrounding technology that role models have, will transfer, at least partially, to female learners' attitudes, beliefs, and choices surrounding technology. A positive correlation was found between teacher modeling and females' BSRI scores; as femininity scores increased, teacher modeling scores also increased ($r = .134$, $p = .05$). No correlation was found between masculinity scores and teacher modeling. This suggests that females who have traditionally feminine traits are influenced more by teacher modeling than those with masculine traits.

Henschke (1998b) writes, "I have observed, in almost a quarter century of preparing adult educators to help adults learn, that the validity of teaching ultimately

derives from a single element: modeling" (p. 11). Schunk (2004), Rodgers (2003), and Schrum (1999) also suggest that teacher modeling is integral in the learning process. This study only found a small predictive value in teacher modeling, but that may be due to the design of the instrument used for measuring teacher modeling of technology.

Assumption 3

The assumption that socialization varies by age and older women are more likely than younger women to exhibit behaviors consistent with the construct of LTH was not upheld. The correlation between age and general computer self-efficacy was not statistically significant ($r = .047$, $p = .05$). However, one interview participant expressed a belief that there are differences between what younger women do and what older women do, which she attributed to changing social norms and family structures.

Theoretical Implications

In light of the analyses, the answer to the primary research question, "Do age, teacher modeling, and the socialization of women into traditional female roles relate to technological self-efficacy in a way that is consistent with the construct of learned technological helplessness?" is "No." While there was a very small correlation between teacher modeling and women's TSE, no correlation was found between age and TSE or between socialization of women into traditional female roles and TSE.

Restructuring the Primary Research Question in Light of the Quantitative Results

I had hoped to demonstrate that through the process of socializing females into traditional roles in U.S. society we, as adult educators, do them a disservice, for in the process, we encourage technological helplessness. In order to do this, I needed to do three things:

1. Provide evidence of a negative correlation between socialization into traditional female roles and TSE, which I failed to do;
2. Provide evidence of a positive correlation between teacher modeling and TSE that was partially mediated by socialization into traditional female roles, which I did; and,
3. Provide evidence of a negative correlation between age and technological self-efficacy that was fully mediated by socialization into traditional female roles, which I failed to do.

In the quantitative portion of the study (n=236), the correlations of gendered traits to technological self-efficacy (see Table 6, page 99) indicate that gendered differences do exist. In only analyzing women and traits associated with women, the research may have been too narrowly focused. Masculine traits also should have been analyzed.

Table 6 shows that of the 10 masculine traits, 6 are significant at $p<.01$ (Strong Personality, Forceful, Have Leadership Abilities, Dominant, Willing to Take a Stand, and Aggressive), and 3 are significant at $p<.05$ (Willing to Take Risks, Independent, and Assertive). The remaining trait (Define Own Beliefs) is not significant. At the same time, only one of the feminine traits is significant at $p<.01$ (warm), and one is significant at $p<.05$ (understanding). Clearly, the predictive value of the masculine traits is superior to that of the feminine traits. Since there is a positive correlation between TSE and the BSRI masculine subscale, the subscale might be used to predict which women would score higher in TSE.

The research question, "Do age, teacher modeling, and the socialization of women into traditional female roles relate to technological self-efficacy in a way that is

consistent with the construct of learned technological helplessness?" might be reframed so that the focus is not only on traditional female roles as a possible contributing factor to women's low TSE. Instead, socialization could be expanded to include factors that are masculine, feminine, and androgynous to examine which factors are most predictive of TSE.

Restructuring the Primary Research Question in Light of the Qualitative Results

From the interviews (n=3), four major patterns emerged. Each pattern is listed with supporting examples:

1. Males and females are socialized to interact differently with technology.
    a. Simone: My dad showered my brother with all types of technological games and systems when he was growing up, and I didn't really get to touch any of that.
    b. Joy: When you think about the other female members of your family or your classmates, do you see any difference between men and women's use of technology, generally speaking?

       Desta: I see, yes, yes, the female, well I don't know about most of my friends, but like the female member of my family, they have no clue about computers or other technology.
2. Adult females do interact with technology differently than the men in their lives.
    a. Ann: Um, I can use those things [appliances with electronic features], basically, but if there's anything that needs to be programmed I leave that up to my husband.

Joy: Talk about why you do that.

Ann: I do that because I feel like he's he knows what he's doing more than I do. Um, because I think that if I, I feel that it will take me a long time to do it because I feel that I'm confused by it and that I have a hard time understanding. I have a hard time doing it.

b. Desta: I just feel like a guy might know better in like technology, I don't know, I always think about that. They know more. Like they know how to fix the TV better than I do, I don't know how to fix TV, they know how to fix TV.

3. Sampled participants' believe that women, in general, are less confident than men when using technology.
    a. Simone: Out of all of my friends, the only one, the only female that I know that can do a technological task, with confidence, is my lesbian best friend. All my other girlfriends always call their boyfriends for help with that.
    b. Ann: I don't feel confident at all about using technology.
4. The way that others teach in both formal and in informal settings impacts how females feel about their technological self-efficacy.
    a. Simone: If I have work processor problems or if I can't connect or if something is not loading, I'll call my brother. And he'll call me an idiot and tell me that I'm disrespecting technology because I don't understand how it works. But then he'll begrudgingly explain to me, in big long words, what's going on and how I can fix it.

Joy: So how does that make you feel when he talks down to you like that?

Simone: Like I'm an idiot. It's so frustrating to have someone like that try and teach you anything. It makes me just stop trying.

The patterns that emerged from the interviews are consistent with what I have observed over the last 12 years in teaching technology to adults and were, in fact, the impetus for this research. In light of the qualitative results, which diverge from the quantitative results, further research is needed. I propose that the next step is to undertake a strictly qualitative study. I would not restructure the primary research question for a qualitative but I would change the format of the interviews to a more structured interview, the reasons for this are discussed in the next section.

Practical Implications

Adult educators should be aware that there is something happening that makes many women feel that they are incompetent when it comes to using technology. I do not use the word *makes* in the literal sense, because people do have choice in how they feel. What I am saying is that since most people do not consciously choose to feel incompetent, adult educators should be cognizant that some female adult learners are feeling incompetent about their abilities to use technology and when such feelings are identified, adult educators should actively look for ways to reduce these feelings in their students.

While the qualitative subsample for this research was small (n=3), all of the women reported similar experiences. These women were a purposive sample who were chosen for their low TSE, so the feelings of incompetence should come as no surprise,

but what is important to note here is that despite their differences in ethnicity (Latina, Caucasian, and Ethiopian immigrant), their SES (wealthy, white-collar, and blue collar families), and their educations (private school and public schools), each woman reported similar experiences that made her feel inferior and inept when using technology. Further, during the course of this study—both the pilot and primary—many women openly admitted that they would make great interview participants and dozens volunteered. In fact, almost any time that I mention the construct of LTH to a group of women, several will immediately begin to express how they can relate to the concept and the older the woman, the more likely she is to relate to this construct.

Adult educators should be cognizant that the problem of low TSE exists for some women, and they should be on the lookout for it. Dyer (2001) says it well in one of his book titles: *You'll See it When you Believe It*. Often times, it is not until we believe that something is occurring that we begin to see it more clearly. That is not to say that we convince ourselves that something exists that does not and then try to prove it, but rather we listen to the voices of our female students, and believe them when they tell us about their struggles in using technology. Then, we will begin to see the phenomenon more clearly and can begin implementing some simple steps to help reduce its occurrence.

The sampled women each made statements indicating that there are specific traits that encourage or discourage them to persist at learning how to use technology. When interview participants were asked about the types of things that would make them more likely to want to learn to use technology, they indicated that relationships and acceptance were keys to feeling safe enough to want to persist. Adult educators are often close in age with their students. This creates a relationship that is unique compared to the

relationships that children have with their adult teachers. In adult education, there is often more of a collegial and trusting relationship between instructors and students, and sometimes students become personal friends with their adult teachers. Adult educators, then, are in a unique position to use their trust in learners' abilities to learn and in students' trust in their teachers to encourage them to learn (Galbraith, 2004; Henschke 1989, 1998b). This trust should also be applied to adult educators who integrate technology into their curricula.

Adult educators can model by being proactive life-long learners of technology. This requires a real commitment, as technology is changing so rapidly. This endeavor does not have to be time consuming, however. It can begin simply enough by subscribing to any listserv or blog that tracks the latest technological trends. Just being informed of technological terminology and changes are good first steps, which are very easy to implement. Boulmetis (1999) believes that, whatever weapon adult educators have "in their arsenal to attack the learning problem, they will use. Technology is one such weapon" (p. 2). Nearly a decade after this statement was initially made, technology is ubiquitous and should now, more than ever, be a weapon in every adult educator's arsenal.

Not all educators embrace technology (Baxter, 2000), but I encourage those adult educators who do not to begin for the simple fact that technology is an integral part of most people lives; it makes sense, then, to use it as a teaching and learning tool. Most adult educators already have many of the tools in place to begin learning about technology and how to implement it in the classroom where appropriate; they simply need to start. For adult educators who use Blackboard or a similar learning management

system (LMS), the process can begin simply enough by learning how other educators, both within and outside the field of adult education, are using technology as a teaching and learning tool. To have such information automatically delivered to the desktop, a Blackboard user can sign up for technology news just by clicking the link to subscribe to the New York Times technology section. Once this selection is made, the most current technology news from the New York Times technology section will appear each time the user logs into Blackboard.

Users of Microsoft Outlook 2007 can also subscribe to RSS (Really Simple Syndication) feeds that will deliver news electronically to the user's inbox. There are literally thousands of free RSS feeds available on every subject imaginable; thousands more are available through purchase. The process is similar to having a print journal delivered to a mailbox. To get started, the adult educator who is unfamiliar with RSS feeds need only ask his/her department IT liaison. The process of subscribing to RSS feeds is so simple that children do it every day.

One of the exciting things about teaching adults is that you learn as much from them as they learn from you. If you are not a tech-savvy educator, then ask your students who are tech-savvy to show you a few tricks. This not only helps you; it helps them in a number of ways:

1. It builds students' confidence that they are smart—smart enough to show the teacher a trick or two.
2. It demonstrates that the teacher is not the all-knowing dispenser of knowledge, but that students can and do generate knowledge.
3. It shows the students that the instructor is also a life-long learner.

4. It models the idea that learning technology is an important skill for education and personal productivity. This is consistent with Henschke's findings (1989, 1998a, 1998b).

For those adult educators who have a good grasp of current technologies, they should look for new and exciting ways to use technology to present lessons and concepts. Most seasoned instructors are aware that they must employ multiple methods to reach all modalities of learners (Boyd, 2004; Gardner, 1983; Rose & Nicholl, 1997), and educational technology offers a multitude of exciting opportunities for integrating diverse methods.

The female interview participants in this study indicated specific ways that instructors could help promote the students' confidence in persisting to learn technology. These included demonstrating patience, using appropriate language for their skill level and, and repetition.

Patience

As teachers at all levels can attest, patience is paramount both for teaching effectiveness and just getting through the day with sanity intact (Chin, Bell, Munby & Hutchinson, 2004; Lightfoot, 1983). Interview participants indicated that patience is important to their desire to move forward in learning to use technology. One participant indicated what would encourage her to learn technology is an instructor who takes the time to sit and explain concepts rather than standing over her talking down to her. For this participant, the willingness to sit indicates patience through the instructor's body language. Also, sitting on the same level as the student signifies a more equal relationship than standing over her.

Time is something that many teachers discriminate on when it comes to their female students. Studies have shown a disparity in both the type of interaction and the amount of time that teachers spend with boys versus girls (Hammer, 1996; American Association of University Women, 1995, 1991). According to Smithson (1990),

> Most teachers in fourth-, sixth-, and eighth-grade classrooms give more of their time to male students, ask them more challenging questions, and allow them more time to talk. 'Male students received significantly more remediation, criticisms and praise then female students.' Since learning correlates with the amount and quality of interaction between students and teachers, male students often have an advantage in the lower grades. (pp. 2-3)

It should be noted, however, this disparate treatment between males and females may vary based on race. Not all boys are treated as equally valuable. Kunjufu (1986, 1985) highlights the increased suspensions and referrals for black males compared to white males. In a similar study, Simmons, Black and Zhou (1991) found increased suspension rates and referrals to be true only for "lower-class and blue collar groups" of black males but not for "the highest class group (white collar and above)" (p. 503).

Despite the differences between how specific groups of males are treated in the classroom by their teachers, there is still ample literature to suggest that, generally speaking, boys and girls are treated differently from an early age, with boys receiving more attention. According to Luke (1994), the disparate treatment that females receive in the early years, translates to their being helpless in college:

> In regards to women's position in discourse, both women and male academics need pedagogical skills with which to help women *unlearn* [italics added] the

> very common self-deprecating speech markers that often preface women's comments (e.g. 'I don't know too much about this, but ...'; 'This may be wrong, but ...', etc.). (p. 225)

These types of self-deprecating remarks are consistent with the utterances that I hear from female students on a regular basis. In fact, the regularity of such remarks is largely responsible for my desire to research the phenomenon of low TSE in females.

Jacobs (1999) offers possible insight into why some women may doubt their abilities in college. In a study of gender differentiation in higher education Jacobs indicates that top tier universities may be returning to practices from the early 20th century, wherein prominent schools capped female enrollment: "Private colleges might be reluctant to admit too many women because it devalues their institutions" (p. 170). If Jacobs is correct in his assertion that some in academia feel that women are a liability to the value of their institutions, then it is easy to understand why women might be reluctant to speak up in college and ask for help, as such feelings cannot go unnoticed or unfelt by those to which they are directed.

The implication for adult educators should be clear—give women a sense that they are valuable and that they have your time and attention as they endeavor to learn new concepts. Traditionally, higher education has been male-centric and Euro-centric (Jackson, 2004), a fact that is well-known to academics, but students may not be consciously thinking about whose voices have traditionally dominated education. What passes for knowledge and whose knowledge is it? Is knowledge universal? How does tradition impact what we do today, and whose voices are heard and whose are silenced? Reflecting on her career as a non-white woman in the predominantly white male

university, Alfred (2001) writes, "It has been established that missing links in these grand theories are the voices and career developmental experiences of those who are non-White males" (p. 123). It is simple and practical for adult educators to discuss epistemology in any and all of their courses.

Instructors could make an extra effort to counteract the notion that women's presence lowers the quality of educational institutions and instead promote the value of women's voices. The European Association for the Education of Adults (EAEA) and the Nordic Network for Adult Learning (NNAL) (2007) developed a Statement on Equal Opportunities that listed several ways that adult educators should promote equality in adult education environments:

1. Adult educators and adult education agencies should campaign for a specific gender focus in policy making by networking at local, regional, national and global levels.
2. Adult educators and adult education agencies should ask questions about the distribution of resources among men and women and also ask which men and which women. Who is marginalised?
3. Adult educators and adult education agencies should reflect on gender differences in motivations for participating in adult learning in general and networks in particular. (p. 3)

Adult educators in the in U.S. should follow suit by creating a similar statement and then working towards achieving said goals. In the interim, individual adult educators can work to achieve such goals in the classes they facilitate.

Language

Listening to and using appropriate language with students is an important skill for adult educators. In fact the European Association for the Education of Adults and the Nordic Network for Adult Learning (2007) called it "critical."

> A critical factor in our future success will be the willingness and ability to listen to what learners of all ages tell us about their learning goals and aspirations. Adult educators must be flexible in their approach; open-minded and supportive; working 'with' learners rather than 'for' them; and respecting them as adults. (p. 2)

In encouraging technology as a learning tool, I suggest using appropriate language in explaining new technological concepts, that is, do not talk over or down to the student. Henschke (1998b) refers to this as having "unconditional positive regard" for students (p. 13). The same construct is measured in the Modified Instructional Perspectives Inventory (IPI) (Henschke, 1994; Stanton, 2005). When adult educators have positive regard for students, they assume that the student is intelligent and capable. Such an adult educator uses correct technical jargon without being overly pedantic.

One of the participants in this study expressed dismay at how her brother had a habit of explaining things to her in language that she did not understand, whereas her best friend would explain things more simply, encouraging her to ask her friend over her brother whenever possible. It is common sense that students will be more reticent with teachers who use intimidating or pedantic language than with those who are easy to understand.

When adult educators use language appropriate to the students' level of understanding, they demonstrate trust and respect (Henschke 1994, 1998b). Remember, that for many of the youngest adult education students, items like cell phones and DVDs

have always been part of their culture and they embrace technology. Other college students recall quite well a time before all of today's gadgets, and some will eschew the use of technology. The key is to strike a balance so that no matter where the students fall on the continuum, they are encouraged to learn more about technology from their teachers.

Repetition

Good teachers know that anytime they introduce a new topic repetition is important (Henschke, 1987). "Several thousand years of experience show that repetition is the most important technique for learning just about anything (O'Hara, 2008, para. 9)." This is particularly true with technology, which feels overwhelming to some women. There often seems to be a fear that they will break the machine. Frequent use of technology, will help the student feel more comfortable in using it and will lessen the fear that she is going to break something. The participant who indicated that she sends hundreds or even thousands of text messages each month, said that her brother—the tech genius—would come to her if he had a question about a phone; she would go to him for everything else. It's reasonable to assume that repetition plays a large part in her comfort level and confidence in using her cell phone.

Although, none of the interview participants were over 30, I can attest that for older learners, repetition is particularly important. I have worked with many female students aged 40-60+ and virtually every one of them has told me how important task repetition is for learning technology. Barnett (2004) indicates that repetition is not only important for helping older adults learn to use computers, it is paramount. "The teaching modules were aimed at meeting the specific needs of older learners - repetition was

important, and indeed, essential. The theory driving the computer training sessions was 'Keep going back more and more hours'" (p. 7).

I assumed that the survey data would show a correlation between age and TSE; it did not. Purposefully selecting a more diverse age range interviewees would have allowed me to compare patterns between age groups. Also, I think that some of the participants overestimated their technological abilities. Based on my experience, there was a disproportionately low number of females who reported low TSE compared to what I would expect to find in the general college student population. Also, I am acquainted with many of the students, faculty, and staff who took the surveys, and even though I do not know which responses belong to which persons, I know that there should have been a higher number of respondents with low TSE, based on my knowledge of and interactions with many of these persons.

It has been my observation and experience that adult educators have a tendency to look for the strengths and capabilities in their students rather than to focus on the weaknesses and deficits in their students. Overall, focusing on the positive makes sense; however, it may behoove us as adult educators to also be aware of the misconceptions that some adults have about their own abilities, particularly in terms of technology usage, and begin focusing on ways to identify shortcomings and reduce them when they are identified. This is not to suggest that we approach our praxis from a standpoint of deficit theory and try to fix what is wrong with our students—because nothing is wrong with them, per se—but rather we should look for holes in students' knowledge and their lack of awareness about these voids and try to find ways to show students what they are missing.

More importantly, adult educators need to help students understand why learning to integrate technology is valuable even before they see the need. Educator and poet, Mali (n.d.) offers a poignant and humorous example of this concept:

> Once, I put a pencil on the desk of a student who was digging in her backpack for a pencil. But she didn't see me do it, so when I walked to the other side of the room and she raised her hand and asked if she could borrow a pencil, I intoned, in the name of Socrates and Jesus, and all the gods of teaching, I declare you already possess everything you will ever need! Shazzam!
>
> "You are the weirdest teacher I have ever-"
>
> Then she saw the pencil on her desk and screamed.
>
> "You're a miracle worker! How did you do that?"
>
> I just gave you what I knew you needed before you had to ask for it. Education is the miracle, I'm just the worker. I'm a teacher. And that's what we do. (para. 8-9)

As Mali indicates, teachers give students what they need before they know they need it. Perhaps adult educators should view technology education for females as one of the things that students need before they know they need it.

One way for adult educators to think about the importance of identifying holes in the knowledge of adult female learners' knowledge and encouraging them to self-reflect is by analogy of an automobile. The individual driver does not need to know everything that a highly skilled mechanic knows, but she does need some basic knowledge. The driver needs to know where to put the gas, and what kind of gas to use. Putting diesel in a gasoline powered car would have disastrous consequences. She needs to know what to do when the check oil light comes on. She needs to have presence of mind to turn off the

ignition or downshift if the brakes fail. Similarly, today's adult learners need to know not to force a USB drive into a fire wire port. She needs to know how to diagnose minor problems with the pieces of technology that she uses, and she need to have the presence of mind to handle herself when the multiplex copier starts spewing paper across the room or sparks start flying from a blown surge protector. These are not superfluous bits of information that only technicians need to know; these types of knowledge are practical for most adult learners today.

Recommendations for Future Research

In this research, I was unable to provide evidence that LTH in women exists as originally proposed. Further research is needed to help determine what factors contribute to women's low TSE. Neither the qualitative data from the interviews nor my observations converge with the quantitative data.

The issue of age will need to be explored further. This could be accomplished through the use of more structured interviews or with an instrument specifically designed to examine age as an indicator of TSE. Clearly, further research is required to reconcile the incongruent findings between the quantitative and qualitative research as it relates to age and TSE.

If future studies confirm teacher modeling is predictive of TSE, then adult educators may want to consider paying closer attention to learning styles of individual students. Some types of learners are more easily influenced than others by what adult educators actually do, rather than what they say, bringing teacher modeling to the fore of how we teach.

If women do, in fact, experience low TSE because of how they are socialized, one possible explanation for why my research results did not support this assumption was provided by researchers at Cornell University. In a study conducted by Kruger and Dunning (1999), the researchers consistently found that those with low ability ranked themselves 50% higher than they actually scored.

> Across four studies the authors found that participants scoring in the bottom quartile on tests of humor, grammar, and logic grossly overestimated their performance and ability. Although the test scores put them in the 12th percentile, they estimated themselves to be in the 62nd. (p. 1121)

The researchers point out that these overestimations are dual-edged to those who make them. "Not only do they reach erroneous conclusions and make unfortunate choices, but their incompetence robs them of the ability to realize it" (p. 1121). While my quantitative results may be correct in that there is no correlation between TSE and women's socialization into traditional female roles, Kruger and Dunning's research indicates that many low scoring participants rate themselves higher than they actually are. Further studies will need to be conducted to confirm that no correlation exists between TSE and women's socialization into traditional gender roles or to determine if there is another possible explanation for these findings, such as overrating of technological ability.

In retrospect, instead of focusing on what it is about women's socialization that may contribute to low TSE, perhaps I should have focused on what it is about men's socialization that may be attributable to greater TSE. The analyses of the BSRI gendered traits and their relationship to TSE indicates that this would be a logical place to start

from a quantitative standpoint. As Table 7 on page 100 shows, 9 of the 10 BSRI masculine traits have statistically significant correlations with TSE.

I believe that a strictly qualitative study with several more interview participants and additional coders is the next step. The patterns or themes that emerge and the information gleaned from such a study could then be used to create new quantitative instruments that might more accurately quantify the construct of learned technological helplessness as originally conceived.

The fact that interviewees expressed beliefs different from the survey data highlights the importance of using both qualitative and quantitative techniques in order to obtain the broadest range of data possible. Using survey instruments only would limit the amount and type of data obtained, while adding interviews allowed the researcher to obtain a greater breadth of data. The goal of using both quantitative methods and qualitative techniques was to triangulate the data. "Triangulation strengthens a study by combining methods" (Patton, 2002, p. 247). Denizen (1978) discusses the strength of triangulation: "No single method ever adequately solves the problem of rival causal factors. Because each method reveals different aspects of empirical reality, multiple methods of observations must be employed" (p. 22).

One excellent example of the usefulness of triangulating data is found in the fact that each of the interview participants mentioned *repetition* as something that they needed in order to want to persist in using technology. Repetition was not something that was originally considered or researched for this study, but through the use of qualitative techniques, it emerged as being important to the participants in terms of increasing their

TSE. If the study had been limited to quantitative methods, the importance of repetition would not have emerged.

In *Adults as Learners*, Cross (1981) pointed out that quantitative research can sometimes miss important information that qualitative research can detect.

> The point is not that the highly quantitative survey research is not useful; it is deeply helpful when viewed from the perspective of a deeper understanding of adult learners. That means taking into consideration the personal and situational characteristics of adult learners, and interpreting research on any single dimension in the context of knowledge about other dimensions. (p. 247)

From this experience, I have learned that there is a great deal more to designing good research than what I had anticipated. Initially, I was woefully unprepared for the amount and breadth of knowledge required to complete a good research study. With the patience of my committee and the advice of several other fantastic professors, I persevered, learning a great deal from each misstep. Then I corrected issues wherever possible. For instance, I started out with what I thought was a mixed methods study and then discovered that I was not really conducting mixed methods, but rather was conducting a primarily quantitative study, which utilized the qualitative technique of interviewing. Correcting a mistake such as this, entails reading more research on mixed methods, gaining a greater understanding of the techniques employed, and correcting improperly used terms throughout my dissertation. Other ah-ha moments come after the research is nearing completion.

One example of an ah-ha moment was after the interviews were complete, and I discovered that a more structured format would have aided me in answering some of the

questions that I had. By conducting less structured interviews, they flowed more naturally, but left me with unanswered questions. Such a realization does not negate the work already completed, but it does help me gain an understanding of how I can improve future research.

Conclusion

I believe that adult educators need to constantly remind themselves that the education system, like all the systems in the U.S., is gendered.

> Culturally speaking, the public world and the private world of the home are gender-coded. Given that one is considered men's domain and the other is considered women's, and that education's ideology and practices are predicated on this dichotomy, gender becomes a basic dimension of the whole system. (Martin, 1998, p. 442)

If the goal of modern adult education is to facilitate the self-actualization of all adult learners, which I argue that it is, then it is paramount that adult educators recognize the inherent inequities in our current educational system and look for ways to correct these issues. This research on women's technological self-efficacy, while only a beginning, is a step in that direction.

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Appendices

Appendix A

Frequency Table of Participants' Ages

Age	Frequency	Percent	Cumulative %
18	2	0.8	0.8
19	3	1.3	2.1
20	23	9.7	11.9
21	23	9.7	21.6
22	20	8.5	30.1
23	26	11	41.1
24	14	5.9	47.0
25	15	6.4	53.4
26	6	2.5	55.9
27	11	4.7	60.6
28	6	2.5	63.1
29	7	3	66.1
30	3	1.3	67.4
31	3	1.3	68.8
32	1	0.4	69.1
33	3	1.3	70.3
34	4	1.7	72.0
35	5	2.1	74.2
36	4	1.7	75.8
37	3	1.3	77.1
39	3	1.3	78.4
40	2	0.8	79.2
41	2	0.8	80.1
42	5	2.1	82.2
43	2	0.8	83.1
44	6	2.5	85.6
45	2	0.8	86.4
46	4	1.7	88.1
48	5	2.1	90.3
49	1	0.4	90.7
50	2	0.8	91.5
51	4	1.7	93.2
52	2	0.8	94.1
55	6	2.5	98.6
56	1	0.4	97.0
58	3	1.3	98.3

59	1	0.4	98.7
60	1	0.4	99.2
61	1	0.4	99.6
65	1	0.4	100.0
	236	100	

Appendix B

Bem Sex Role Inventory Permissions

mind garden

www.mindgarden.com

To whom it may concern,

This letter is to grant permission for the above named person to use the following copyright material;

Instrument: ***Bem Sex-Role Inventory***

Author: ***Sandra Lipsitz Bem***

Copyright: ***1978, 1981 Consulting Psychologists Press, Inc.***

for his/her thesis research.

Five sample items from this instrument may be reproduced for inclusion in a proposal, thesis, or dissertation.

The entire instrument may not be included or reproduced at any time in any other published material.

Sincerely,

Vicki Jaimez
Mind Garden, Inc.
www.mindgarden.com

Authors note: Per permission letter, five item sample is shown in *Figure 3*, on page 85 of this dissertation.

Appendix C

General Computer Self-Efficacy (GCSE) InstrumentOften in our jobs we are told about software packages that are available to make work easier. For the following questions, imagine that you were given a new software package for some aspect of your work. It doesn't matter specifically what this software package does, only that it is intended to make your job easier and that you have never used it before.

The following questions ask you to indicate whether you could use this unfamiliar software package under a variety of conditions. For each of the conditions, please indicate whether you think you would be able to complete the job using the software package. Then, for each condition that you answered "yes," please rate your confidence about your first judgment, by circling a number from 1 to 10, where 1 indicates "Not at all confident," *5* indicates "Moderately confident," and 10 indicates "Totally confident."

For example, consider the following sample item:

I COULD COMPLETE THE JOB USING THE SOFTWARE PACKAGE...

	NOT AT ALL CONFIDENT			MODERATELY CONFIDENT				TOTALLY CONFIDENT	
...if there was someone giving me step by step instructions.	(YES)	1	2	3	4	(5)	6	7	8	9	10

The sample response shows that the individual felt he or she could complete the job using the software with step by step instructions (YES is circled), and was moderately confident that he or she could do so (5 is circled).

I COULD COMPLETE THE JOB USING THE SOFTWARE PACKAGE...

		NOT AT ALL CONFIDENT			MODERATELY CONFIDENT				TOTALLY CONFIDENT	
Q-1.	...if there was no one around to tell me what to do as I go.	YES 1	2	3	4	5	6	7	8	9	10
		NO									
Q-2.	...if I had never used a package like it before.	YES 1	2	3	4	5	6	7	8	9	10
		NO									
Q-3.	...if I had only the software manuals for reference.	YES 1	2	3	4	5	6	7	8	9	10
		NO									
Q-4.	...if I had seen someone else using it before trying it myself.	YES 1	2	3	4	5	6	7	8	9	10
		NO									
Q-5.	...if I could call someone for help if I got stuck.	YES 1	2	3	4	5	6	7	8	9	10
		NO									
Q-6.	...if someone else had helped me get started.	YES 1	2	3	4	5	6	7	8	9	10
		NO									
Q-7.	...if I had a lot of time to complete the job for which the software was provided.	YES 1	2	3	4	5	6	7	8	9	10
		NO									
Q-8.	...if I had just the built-in help facility for assistance.	YES 1	2	3	4	5	6	7	8	9	10
		NO									
Q-9.	...if someone showed me how to do it first.	YES 1	2	3	4	5	6	7	8	9	10
		NO									
Q-10.	if I had used similar packages before this one to do the same job.	YES 1	2	3	4	5	6	7	8	9	10
		NO									

Appendix D

Demographic Instrument

Please provide the following demographic information about yourself.

1. Age: _____
2. Ethnicity:
    a. African-American/Black
    b. Caucasian/White
    c. Asian/Pacific Islander
    d. Hispanic/Latino
    e. Native American
    f. Other _____
3. Years of education: _____

Appendix E

Teacher Modeling Instrument Pilot

This instrument measures how your teachers have appeared while using technology in the classroom. These statements can apply to either past or present teachers. Please circle the answer that best describes how you feel about each statement below. A score of 1 means that you strongly disagree and a score of 5 means that you strongly agree.

	Strongly Disagree				Strongly Agree
1. Most of my teachers use/used technology competently.	1	2	3	4	5
2. My favorite teacher uses/used technology effectively.	1	2	3	4	5
3. The teachers that I have/had embrace technology.	1	2	3	4	5
4. My teachers say good things about technology.	1	2	3	4	5
5. My teachers have raised my confidence in using technology.	1	2	3	4	5
6. My teachers often use technology in the classroom.	1	2	3	4	5
7. My teachers display a high level of confidence when using technology to teach.	1	2	3	4	5
8. I have learned to use technology better because of my teachers.	1	2	3	4	5

Created by Joy E. Harris and J. Rico Drake, 2007

Appendix F

Teacher Modeling Instrument Modified and Used in Primary Study

This instrument measures how your teachers have appeared while using technology in the classroom. AS YOU COMPLETE THE SURVEY, PLEASE THINK ABOUT **ALL** THE TEACHERS THAT YOU HAVE HAD THROUGHOUT YOUR FORMAL EDUCATION, NOT JUST YOUR RECENT TEACHERS. Please circle the answer that best describes how you feel about each statement below. A score of 1 means that you strongly disagree and a score of 5 means that you strongly agree.

	Strongly Disagree				Strongly Agree
1. Most of my teachers use/used technology competently.	1	2	3	4	5
2. The teachers that I have/had embrace technology.	1	2	3	4	5
3. My teachers say good things about technology.	1	2	3	4	5
4. My teachers often use technology in the classroom.	1	2	3	4	5
5. My teachers display a high level of confidence when using technology to teach.	1	2	3	4	5

Created by Joy E. Harris and J. Rico Drake, 2007

Appendix G

Beliefs and Self-Selection Instrument

This research is an attempt to understand a new construct called Learned Technological Helplessness or LTH and how it may affect women. LTH is a psychological condition in which a human has learned to believe, based on past failures using technology, that s/he is helpless in utilizing technology in the future even though s/he might have control over the outcome.

Please answer the following by circling yes or no at the end of each question. Your answers will help determine if you may have attitudes or beliefs consistent with the construct of Learned Technological Helplessness.

1. I have not been very successful in using technology as a learning tool. YES NO

2. Most people that I know can use technology better than I can. YES NO

3. Because I have not been very successful at using technology in the past, I do not think that I will be very successful at using technology in the future. YES NO

4. I would not use technology to complete a task if I could avoid it. YES NO

5. I often make self-deprecating remarks about my ability to use technology. ("I've always been stupid when it comes to technology" or "I'm just technologically incompetent.") YES NO

6. Do you believe that your peers are better at using technology than you? ("Everyone else in my class gets this, but I know I never will" or "I know the other managers all use the new system, but I just can't understand it.") YES NO

7. I have had failures in other areas of my life that lead me to believe that I will not have good luck when using technology. YES NO

If you are interested in being contacted for an interview, which will last **approx 1 hour**, please fill out the following information. Filling out the form does not guarantee selection for an interview, as interview participants will be randomly selected.

Those who are selected and agree to be interviewed will be compensated $20 for their time.

Please check one of the following:

☐ No, I would not like to be interviewed.

☐ Yes, I would like to be interviewed. **I will be paid $20 at the end of the interview, which will last approximately 1 hour.**

If you chose to be interviewed above, please provide your name as well as the best way to reach you in the space below.

Appendix H

UMSL IRB Approval Letter

University of Missouri St. Louis

OFFICE OF RESEARCH ADMINISTRATION

Interdepartmental Correspondence

Name: Joy Harris

Title: The Impact of Gender Socialization On Women's Learned Technological Helplessness And Its Andragogical Implications: A Mixed Methods Study

The chairperson of the Human Subjects Committee for UM-St. Louis has reviewed the above mentioned protocol for research involving human subjects and determined that the project qualifies for expedited review under Title 45 Code of Federal Regulations Part 46.110b. The time period for this approval expires one year from the date listed below. You must notify the Human Subjects Committee in advance of any proposed major changes in your approved protocol, e.g., addition of research sites or research instruments.

You must file an annual report with the committee. This report must indicate the starting date of the project and the number of subjects to date from start of project, or since last annual report, whichever is more recent.

Any consent or assent forms must be signed in duplicate and a copy provided to the subject. The principal investigator must retain the other copy of the signed consent form for at least three years following the completion of the research activity and they must be available for inspection if there is an official review of the UM-St. Louis human subjects research proceedings by the U.S. Department of Health and Human Services Office for Protection from Research Risks.

This action is officially recorded in the minutes of the committee.

Protocol Number	Date	Signature - Chair
080226Ha	3-3-08	

Appendix I

UMKC SSIRB Approval

Harris, Joy E.

From:	Hughes, Germaine
Sent:	Wednesday, March 12, 2008 1:40 PM
To:	Harris, Joy E.
Cc:	Good, Megan; Isaac, Paulette; Day, Nancy
Subject:	SSIRB Protocol # 080105 - The Impact of Gender Socialization on Women's Learned Technological Helplessness and its Andragogical Implications: A Mixed Methods Study
Attachments:	Harris 080105 Stamped Consent 3 12 08.pdf

Joy Harris
UMKC - SOE
SOE 129

Approval Date: March 12, 2008

RE: Protocol # 080105 - The Impact of Gender Socialization on Women's Learned Technological Helplessness and its Andragogical Implications: A Mixed Methods Study

Dear Ms. Harris:

This is to inform you that your project proposal listed above was reviewed through the Social Sciences Institutional Review Board's expedited review process and has received approval under Category 7 of the categories of research that may receive expedited review. You may therefore proceed with your study. Notwithstanding the SSIRB's approval to conduct the study, in the following situations you must provide timely additional information in order to maintain the SSIRB's approval.

1. The SSIRB cannot approve studies for more than one year. Unless the SSIRB renews its approval, your authority to conduct this study will expire on the anniversary of this letter. To request a continuation of your authority to conduct the study you will need to submit a completed Research Progress Report to the SSIRB office. Your authority to conduct the study cannot be continued until your completed Research Progress Report has received the necessary SSIRB review and approval. Therefore, you need to submit the completed Research Progress Report at least one month prior to the anniversary date of your project's approval/reapproval. The date of this letter is the approval date for your study. However, if your study requires more than one extension, the applicable anniversary date may change from year-to-year. Consult your most recent approval/reapproval letter for the applicable anniversary date. Call the SSIRB office if you have questions about this.

2. If you want to make a change to the study, you must obtain the SSIRB's prior approval of the change.

3. If you want to add or delete investigators from the study, you must obtain the SSIRB's prior approval of the addition or deletion.

4. If a participant in your study is injured in connection with their participation, you must inform the SSIRB regarding this adverse event in a timely way.

Please inform the SSIRB when you complete the study.

If we can be of further assistance, please don't hesitate to call the SSIRB office at

816-235-1764. Best wishes for a successful study.

PLEASE NOTE:
If you are using a signed consent form you must use the copy
of the consent form that has been stamped and approved by the SSIRB, which is attached, before you begin
consenting subjects. All subjects must be consented on a copy of the approved consent form with the SSIRB Stamp.
If requested, a hard copy of the stamped consent can be mailed to you.

Thanks,

Ms. Germaine Hughes
Administrator
Social Sciences Institutional Review Board
University of Missouri - Kansas City
5319 Rockhill Road
Kansas City, MO 64110-2499
Office: 816-235-1764
Fax: 816-235-5602
hughesge@umkc.edu

Appendix J

UMSL Informed Consent

Consent for Participation in a Research Study

Joy E. Harris, Ph.D. candidate

Invitation to Participate
You are invited to participate in a research study.

Who Will Participate
Anyone female 18 years of age and older may participate. I hope to recruit 200 people to volunteer for this project.

Purpose
The purpose of this research project is to see if there is a link between how women are taught to behave in American society and their ability to use computers. The knowledge gained about how gender roles affect women's ability to use technology will help educators make informed decisions about the design and implementation of their courses, major factors in the equitable assignment of educational opportunities in our society.

Description of Procedures
Everyone who participates will fill out a set of questionnaires that will take approximately 15 minutes to complete. Since names are not on surveys, participants are not identified.

Some participants may choose to be interviewed; if you choose to be interviewed and are among those randomly selected from those who so elect, the interview will take approximately 1 hour and will be tape recorded and later transcribed. The interview may take place at any neutral location acceptable to both interviewer and interviewee. Those who are selected for and complete the interview will be compensated $20 cash for their time.

While the interview is unstructured, the types of questions that may be asked are as follows:

- Tell me about a time when you had difficulty using technology.
- How have you solved problems using technology?
- Thinking back on your teachers, can you talk a little about what effect their technology usage has had on the ways that you use technology?
- Think about the men in your life and how they use technology. How is it different than how you use technology?
- What types of failures have you had in other areas of your life that you think may have impacted how us look at and use technology?

Voluntary Participation
Participation in this study is voluntary at all times. You may choose to not participate or to
withdraw your participation at any time. Deciding not to participate or choosing to leave the study will not result in any penalty or loss of benefits to which you are entitled.

If you decide to leave the study, the information you have already provided will be used with your permission, or destroyed immediately at your request. In order to withdraw, you have only to inform me, and you will be asked about your wishes regarding the data you may have already provided.

Fees and Expenses
There are no fees or expenses related to participating in this study.

Compensation
In appreciation for your participation, you will receive candy, a cereal bar, or fruit for completing the survey packet. If you are interviewed, you will be paid $20 for the interview, which will last approximately 1 hour.

Risks and Inconveniences
Participation in this study will present no greater risk to you than what might be experienced in everyday life.

Benefits
While there are no measurable benefits to participants, reflecting on ones ideas and beliefs about gender roles as they relate to women's ability to use technology may be an intangible benefit to some participants.

Confidentiality
The information that is obtained during this research project will be kept strictly confidential and will **NOT** become a part of your university record. Your anonymity will be protected by the use of a project ID number in place of your name or other identifying information. Electronic data will be stored on a secured computer, and written data will be stored in a locked office in a secure location where only the principal investigator will have access. All individual information will be shredded/erased after a period of 10 years.

While every effort will be made to keep confidential all of the information you complete and share, it cannot be absolutely guaranteed. Individuals from the University of Missouri-Kansas City Institutional Review Board (a committee that reviews and approves research studies), Research Protections Program, and Federal regulatory agencies may look at records related to this study for quality improvement and regulatory functions."

In Case of Injury
The University of Missouri-St. Louis appreciates the participation of people who help it carry out its function of developing knowledge through research. If you have any

questions about the study that you are participating in you are encouraged to call **Joy Harris,** the investigator, at **816-235-1299.**
Although it is not the University's policy to compensate or provide medical treatment for persons who participate in studies, if you think you have been injured as a result of participating in this study, please call the IRB Administrator of UMSL's Institutional Review Board at 314-516-5928

Questions

Joy E. Harris, Ph.D. candidate
Educational Technologist
University of Missouri-Kansas City
129 Education Building
5100 Rockhill Road
Kansas City, MO 64110-2499
816-235-1299
harrisjoy@umkc.edu

Authorization

Joy E. Harris, Principal Investigator	Date
Participant signature	Date
Participant name (please print)	

Appendix K

UMKC Informed Consent

Consent for Participation in a Research Study
Joy E. Harris, Ph.D. candidate

Invitation to Participate
You are invited to participate in a research study.

Who Will Participate
Anyone female 18 years of age and older may participate. I hope to recruit 200 people to volunteer for this project.

Purpose
The purpose of this research project is to see if there is a link between how women are taught to behave in American society and their ability to use computers.

Description of Procedures
Everyone who participates will fill out a set of questionnaires that will take approximately 15 minutes to complete. Some participants may choose to be interviewed; if you choose to be interviewed and are among those randomly selected from those who so elect, the interview will take approximately 1 hour. **The interview will be digitally recorded.**

Voluntary Participation
Participation in this study is voluntary at all times. You may choose to not participate or to withdraw your participation at any time. Deciding not to participate or choosing to leave the study will not result in any penalty or loss of benefits to which you are entitled.

If you decide to leave the study, the information you have already provided will be used with your permission, or destroyed immediately at your request. In order to withdraw, you have only to inform me, and you will be asked about your wishes regarding the data you may have already provided.

Fees and Expenses
There are no fees or expenses related to participating in this study.

Compensation
In appreciation for your participation, you will receive candy, a cereal bar, or fruit for completing the survey packet. If you are interviewed, you will be paid $20 for the interview, which will last approximately 1 hour.

Risks and Inconveniences
Participation in this study will present no greater risk to you than what might be experienced in everyday life.

Benefits

Participants may benefit directly from reflecting on their own ideas and beliefs about gender roles and as they relate to women's ability to use technology. The knowledge gained about how gender roles affect women's ability to use technology will help educators make informed decisions about the design and implementation of their courses, major factors in the equitable assignment of educational opportunities in our society.

Confidentiality

The information that is obtained during this research project will be kept strictly confidential and will **NOT** become a part of your university record. Your anonymity will be protected by the use of a project ID number in place of your name or other identifying information. Electronic data will be stored on a secured computer, and written data will be stored in a locked office in a secure location where only the principal investigator will have access. All individual information will be shredded/erased after a period of 10 years.

While every effort will be made to keep confidential all of the information you complete and share, it cannot be absolutely guaranteed. Individuals from the University of Missouri-Kansas City Institutional Review Board (a committee that reviews and approves research studies), Research Protections Program, and Federal regulatory agencies may look at records related to this study for quality improvement and regulatory functions."

In Case of Injury

The University of Missouri-Kansas City appreciates the participation of people who help it carry out its function of developing knowledge through research. If you have any questions about the study that you are participating in you are encouraged to call **Joy Harris,** the investigator, at **816-235-1299.**

Although it is not the University's policy to compensate or provide medical treatment for persons who participate in studies, if you think you have been injured as a result of participating in this study, please call the IRB Administrator of UMKC's Social Sciences Institutional Review Board at 816-235-1764.

Questions

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5100 Rockhill Road
Kansas City, MO 64110-2499
816-235-1299
harrisjoy@umkc.edu

Authorization

Joy E. Harris, Principal Investigator	Date
Participant signature	Date
Participant name (please print)	

Appendix L

UMSL Informational Letter

Informational Letter for Educational Research Study

Joy E. Harris, Ph.D. candidate

Invitation to Participate

You are invited to participate in a research study.

Who Will Participate

Anyone female 18 years of age and older may participate. I hope to recruit 200 people to volunteer for this project.

Purpose

The purpose of this research project is to see if there is a link between how women are taught to behave in American society and their ability to use computers.

Description of Procedures

Everyone who participates will fill out a set of questionnaires that will take approximately 15 minutes to complete. Some participants may choose to be interviewed; if you choose to be interviewed and are among those randomly selected from those who so elect, the interview will take approximately 1 hour.

Voluntary Participation

Participation in this study is voluntary at all times. You may choose to not participate or to withdraw your participation at any time. Deciding not to participate or choosing to leave the study will not result in any penalty or loss of benefits to which you are entitled. If you decide to leave the study, the information you have already provided will be used with your permission, or destroyed immediately at your request. In order to withdraw, you have only to inform me, and you will be asked about your wishes regarding the data you may have already provided.

Fees and Expenses

There are no fees or expenses related to participating in this study.

Compensation

In appreciation for your participation, you may receive compensation in one of two ways:

1. You may choose to receive an edible item, such as candy, a cereal bar, or fruit for completing the survey packet. Selections may vary by collection site.

2. If you are being recruited from a cooperating instructor's class, you may elect to receive points for participation. Whether bonus points are offered and how many will be set by the individual instructor. In this case, each participant will write her name, course number, and instructor's name on a provided list when handing in the survey packet. This information will in no way be linked to the survey instruments. The researcher will provide a list via e-mail to each cooperating instructor indicating that the named students did complete a survey packet. The student will be responsible for verifying that her points have been added as agreed by the participating instructor. Since most instructors use Blackboard, verifying bonus points should be as simple as checking the Blackboard grade book.

Additionally, participants may enter their names into a pool from which interviewees will be randomly selected for an interview. Entering a one's name for consideration does not guarantee that one will be selected for an interview. If selected and interviewed, the participant will be paid $20 for the interview, which will last approximately 1 hour. Participants may quit at any time, but only those who complete the interview will be paid.

Risks and Inconveniences

Participation in this study will present no greater risk to you than what might be experienced in everyday life.

Benefits

Participants may benefit directly from reflecting on their own ideas and beliefs about gender roles and as they relate to women's ability to use technology. The knowledge gained about how gender roles affect women's ability to use technology will help educators make informed decisions about the design and implementation of their courses, major factors in the equitable assignment of educational opportunities in our society.

Confidentiality

The information that is obtained during this research project will be kept strictly confidential and will **NOT** become a part of your university record. Your anonymity will be protected by the use of a project ID number in place of your name or other identifying information. Electronic data will be stored on a secured computer, and written data will be stored in a locked office in a secure location where only the principal investigator will have access. All individual information will be shredded/erased after a period of 10 years.

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research studies), Research Protections Program, and Federal regulatory agencies may look at records related to this study for quality improvement and regulatory functions."

In Case of Injury

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Although it is not the University's policy to compensate or provide medical treatment for persons who participate in studies, if you think you have been injured as a result of participating in this study, please call the IRB Administrator of UMSL's Institutional Review Board at 314-516-5928.

Questions

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Appendix M

UMKC Informational Letter

Informational Letter for Educational Research Study

Joy E. Harris, Ph.D. candidate

Invitation to Participate

You are invited to participate in a research study.

Who Will Participate

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Purpose

The purpose of this research project is to see if there is a link between how women are taught to behave in American society and their ability to use computers.

Description of Procedures

Everyone who participates will fill out a set of questionnaires that will take approximately 15 minutes to complete. Some participants may choose to be interviewed; if you choose to be interviewed and are among those randomly selected from those who so elect, the interview will take approximately 1 hour.

Voluntary Participation

Participation in this study is voluntary at all times. You may choose to not participate or to withdraw your participation at any time. Deciding not to participate or choosing to leave the study will not result in any penalty or loss of benefits to which you are entitled.

If you decide to leave the study, the information you have already provided will be used with your permission, or destroyed immediately at your request. In order to withdraw, you have only to inform me, and you will be asked about your wishes regarding the data you may have already provided.

Fees and Expenses

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Risks and Inconveniences

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Questions

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